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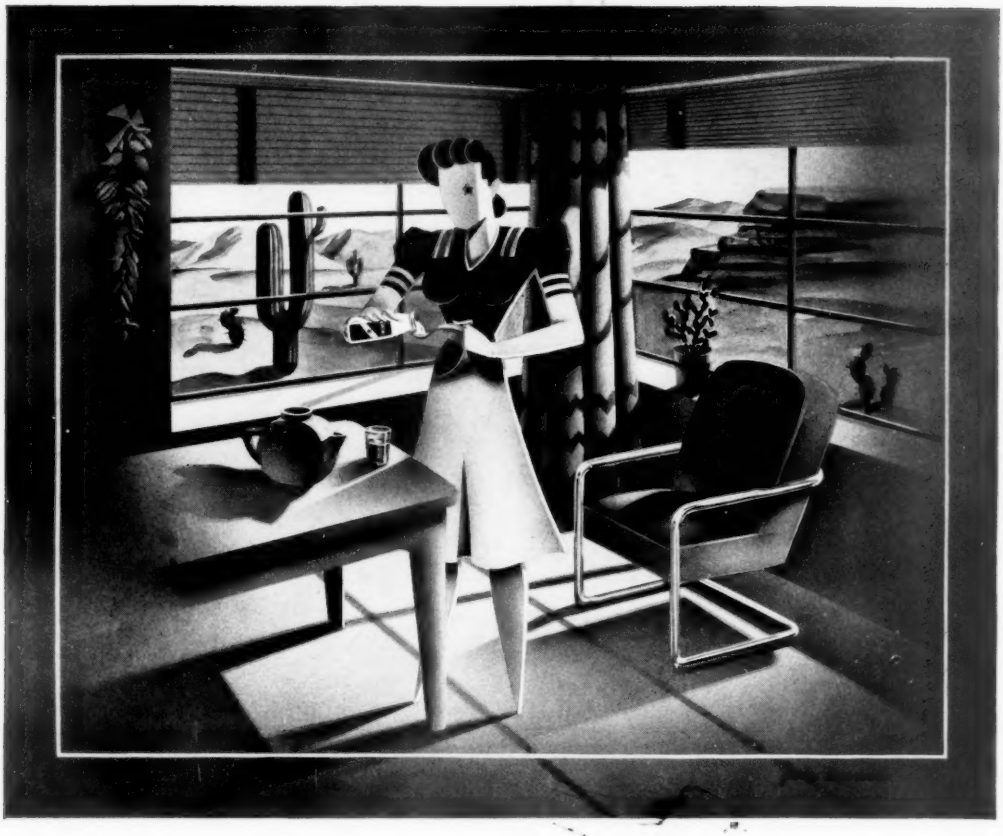

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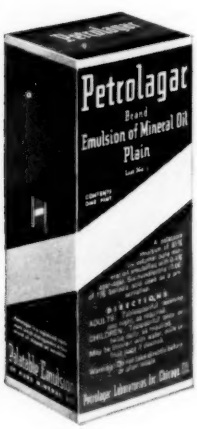

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ROENTGEN RAY EXAMINATION OF THE SMALL INTESTINE IN NUTRITIONAL DISTURBANCES.*

Ross Golden, M.D.,
New York, N. Y.

Introduction

When the history of the present medical age is written, the investigation of the problems of nutrition will stand out as a major achievement. Numerous writers have testified that malnutrition in its various forms is far from uncommon in this land of plenty and that its clinical manifestations are greatly varied. It is of considerable importance to recognize this condition, particularly in its early stages, and to correct it without delay. To this end roentgen ray methods of examination seem to be making an increasingly important contribution.

The purpose of this paper is to discuss the disturbances in the physiology and morphology of the small intestine, which are associated with abnormal nutritional conditions, and their manifestations on roentgen ray examination.

In this discussion the term "deficiency state" will be used in a broad sense to imply a lack of some important factor necessary for proper functioning of the organism, e.g. vitamin or protein, even though the exact nature of the deficiency or deficiencies may not be known.

Classification

Deficiency states have been divided into two broad groups, primary and secondary.

Primary deficiency states are those which apparently arise without obvious cause, e.g. celiac disease, non-tropical sprue, etc. Possibly a chronically deficient diet may be a factor.

Those deficiency states are classed as secondary in which the condition is caused by, or at least associated with, disease of the gastro-intestinal tract which might interfere with the digestion or absorption of nutriment, e.g. peptic ulcer, carcinoma, primary disease of the small intestine such as sclerosing enteritis or tuberculosis, primary disease of the mesentery such as sclerosing inflammation of the lymphatics or lymphoblastoma, or biliary tract disease. They also result from the low vitamin intake incidental to some therapeutic diets or to voluntary dietary restriction.

Literature

Attention was first called to the changes in the small intestine demonstrable by roentgen ray methods in "chronic steatorrhoea" by Snell and Camp (1934). Mackie and Pound (1935) found the same changes in tropical sprue. Mackie, Miller and Rhoads (1935) described similar changes associated with severe chronic colitis. The writer (1936) pointed out similar but usually less marked disturbances in the small intestine in cases of infantile celiac disease. Snell and Camp remarked that the changes they noted were probably not specific and could be caused by other conditions. In this connection it is of interest that Vespignani (1925) described in four cases exactly the same type of small intestine disturbance which he called small intestinal stasis without obstruction, and at operation found "chronic mesenteritis"; his patients apparently did not have steatorrhoea. Gutzeit and Kuhlbaum (1934) demonstrated hypomotility and dilatation of the small intestine in icterus and showed by experiments on dogs that the disturbance was due to a lack of bile in the intestine and could be relieved by the oral administration of bile. Barden and his co-workers (1938) showed that similar intestinal disturbances could be produced in dogs by lowering the serum protein and could be made to disappear by raising the blood protein to normal.

*From the Departments of Radiology of the Presbyterian Hospital and of the College of Physicians and Surgeons, Columbia University, New York.

Read before the joint meeting of the Medical Society of Virginia and the West Virginia State Medical Association at White Sulphur Springs, W. Va., July 29-31, 1940.

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Thus it appears that Snell and Camp's prediction was correct and that these roentgen abnormalities of small intestinal morphology and physiology may be associated with a number of different conditions.

TECHNIQUE OF EXAMINATION

Abnormalities of the small intestine in deficiency states are often noted on ordinary barium meal examination of the gastro-intestinal tract, if the examiner takes the trouble to look at whatever loops of jejunum or ileum which happen to be filled. However, these changes are best brought out by a special examination of the small intestine which we have come to call a "small intestine study".

The patient appears for examination early in the morning without breakfast. Two ounces of plain barium sulphate stirred up in water are given and the stomach and duodenum are examined in the usual way. Films of the abdomen with the patient prone are taken at half-hourly intervals until the barium reaches the cecum or until five hours have elapsed, when the patient is given lunch. Eating is normally followed by increased motility of the small intestine. Fluoroscopic observations are made at least two or three times during the procedure.

THE NORMAL SMALL INTESTINE

Recognition of the changes under discussion depends upon familiarity with the appearance of the normal small intestine. Good discussions of the roentgen manifestations of the normal small intestine have been published by Menville and Ané; Cole; Ravdin, Pendergrass, Johnston and Hodes; and others. The details cannot be repeated here.

In brief, (Figure 1) the barium shadow of the normal small intestine is usually continuous and the lumen is even in width except where a contraction happens to be taking place. The peristaltic constrictions are usually short and the wall promptly relaxes behind them. The width of the jejunal shadow averages 2.5 to 3.0 cm., and that of the ileum 2.0 to 2.5 cm. The high mucosal folds of the jejunum give the barium shadow the characteristic feathery appearance. These folds are usually 1 to 2 mm. wide and lie very close to each other, 1 to 3 mm. apart. Lower in the jejunum the folds become lower and lie farther apart but are not wider. The ileal margins often appear smooth but low mucosal folds can usually be demonstrated by pressure films.

FIGURE 1
NORMAL SMALL INTESTINE

The barium shadow is continuous. The lumen is even in caliber except at the site of short peristaltic contractions. The mucosal folds are normal in width and spacing.

Under normal conditions the barium reaches the cecum in from one and one-half to five hours, the average being between two and four hours; the ileum contains barium at six hours and is empty at nine hours. Eating is normally followed by increased motility of the small intestine; occasionally the normal ileum does not begin to expel barium until food is taken.

CLINICAL MANIFESTATIONS

Deficiency states may occur at any age, from newborn infants to the aged. Andersen found atrophy of the pancreas associated with celiac disease in newborn infants, indicating that the disturbance was initiated before birth.

The clinical manifestations of deficiency states are very variable and cannot be discussed here at length. However, symptoms of some sort of digestive tract disturbance are present in most deficiency conditions.

The signs of celiac disease in infants (Figure 2) are summarized by Andersen as (1) failure to gain

FIGURE 2
INFANTILE CELIAC DISEASE

Abnormal segmentation of the middle of the small intestine with coarsening of the mucosal folds of the jejunum. (One and one-fourth hours.)

Unit No. 483539. A twenty-three-month-old girl was admitted because of malnutrition. At ten months she began to vomit without apparent cause but later improved for a while. For five weeks before admission she had a poor appetite and watery diarrhoea with six to ten stools daily. Physical examination showed emaciation, abdominal distention, generalized oedema, hypotonia and wasting of the muscles. The tongue was red and raw. The skeleton was markedly decalcified. Blood calcium 8.3; Phosphorus 3.7; Serum protein 3.77. With a high protein, high vitamin diet and liver extract intramuscularly she improved rapidly and was discharged eleven weeks after admission.

weight on an adequate diet, (2) a large abdomen at birth, (3) hunger, (4) absence of diarrhoea or vomiting, (5) large stools, sometimes recognized as fatty, (6) intolerance to fat, and (7) chronic infection of the respiratory tract. Andersen states that celiac disease with atrophy of the pancreas can be differentiated from celiac disease with a normal pancreas only by demonstrating the absence of pancreatic enzymes in the duodenal contents or by pathologic examination of the pancreas.

The group of primary deficiency conditions in adults usually called chronic steatorrhoea, sprue, non-tropical sprue (Figures 3A, 3B, 3C), adult celiac disease, etc., is usually associated at times during the course of the disease with diarrhoea with an excess of fat in the stools, with variable abdominal distress and sometimes with rapid loss of weight. In some cases of atypical deficiency conditions no diarrhoea or excess of fat in the stools may be present and the symptoms may suggest some other abdominal condition, for example peptic ulcer (Figure 4).

FIGURE 3A
NONTROPICAL SPRUE (ADULT CELIAC DISEASE)

Examination November 26, 1935, showed dilatation of the jejunum with absence of the mucosal folds and fluid levels. (See Figures 3B and 3C.)

The symptoms of a secondary deficiency state may be entirely obscured by those of the primary condition, such as chronic peptic ulcer with gastric retention, chronic sclerosing enteritis, or chronic ulcerative colitis. On the other hand the symptoms of a deficiency state may be the only clinical manifestations of the primary disease, e.g. lymphosarcoma of the intestine (Lehmkuhl; Golden) or sclerosing mesenteritis.

In many primary deficiency states a low blood calcium is often present with demineralization of the skeleton and even tetany (Pendergrass and Comroe). In some cases the blood protein is low and may be

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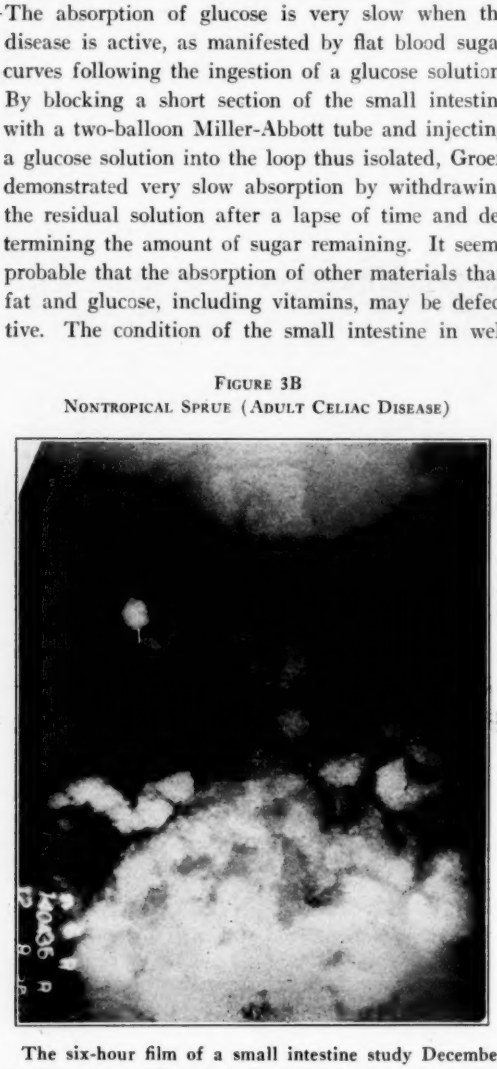
low enough to cause oedema. Hyperchromic anaemia is often found, which may suggest pernicious anaemia. Free HCl is usually present in the stomach. The absorption of glucose is very slow when the disease is active, as manifested by flat blood sugar curves following the ingestion of a glucose solution. By blocking a short section of the small intestine with a two-balloon Miller-Abbott tube and injecting a glucose solution into the loop thus isolated, Groen demonstrated very slow absorption by withdrawing the residual solution after a lapse of time and determining the amount of sugar remaining. It seems probable that the absorption of other materials than fat and glucose, including vitamins, may be defective. The condition of the small intestine in well

FIGURE 3B
NONTROPICAL SPRUE (ADULT CELIAC DISEASE)



The six-hour film of a small intestine study December 6, 1935, shows "flocculation" of the barium, which has not yet reached the cecum. (See Figure 3C.)

advanced cases, therefore, may be part of a vicious circle which may have to be interrupted by the parenteral administration of vitamins.

The only proof of the accuracy of a diagnosis of a deficiency state is the patient's response to specific vitamin therapy. Often the parenteral administration of liver extract is followed by prompt improvement. One patient responded only to a banana diet. This type of proof can hardly be considered satisfactory in the scientific sense. Chemical and other types of tests for the concentration of certain specific vitamins in the blood and urine are being continu-

FIGURE 3C
NONTROPICAL SPRUE (ADULT CELIAC DISEASE) AFTER TREATMENT

The two and one-half-hour film April 26, 1940, discloses no evidence of dilatation of the jejunum. Mucosal folds are now present but are slightly coarsened. Motility is still a little slower than usual. The examination shows evidence of marked improvement in the morphology and physiology of the intestine as compared with the examinations in 1935.

Unit No. 473118. A thirty-four-year-old man was admitted because of diarrhoea and loss of twenty-five pounds weight of two months' duration and epigastric distress relieved by induced vomiting, and intermittent chills and fever of four months' duration. Physical examination was negative except for emaciation and a protruding abdomen. The stools were light and foamy, and contained fatty acid crystals. Definite improvement appeared following two injections of liver extract. The treatment consisted of a "sprue diet" including bananas and intramuscular injections of liver. After two years the latter were discontinued and the extract was given by mouth. In 1937 he had diarrhoea for three days after omitting bananas from his diet for a week. In 1940 he was perfectly well without liver extract, taking three to four bananas a day and Vitamin B Complex.

ously developed but opinion is not yet unanimous as to their reliability and significance. At present good clinical judgment seems to be the best test.

INTESTINAL PATHOLOGY

The pathologic changes in the intestinal tract in deficiency states, like the clinical manifestations, are variable both in experimental animals and in clinical cases, according to the reports in the literature. Atrophy of all of the coats of the bowel and degeneration of nerve cells in the ganglia of the intestinal wall were found by McCarrison in monkeys and pigeons which had been given a very deficient diet until they died; these animals showed striking individual variations, not only in the pathologic changes in the intestinal tract but in other organs as well. Somewhat similar findings have been observed in advanced human deficiency states, such as sprue, pellagra, and beri-beri, with striking individual variations. Ulcers of the small intestine may be present and may perforate (Manson-Bahr, 1924), as happened in one of our cases. Hemorrhage into the mucous membrane and into the lumen has been observed. Oedema of the mucosa, of the submucosa, and atrophy of the mucosa and of the muscle coat have been found.

Very little seems to be known about the pathologic changes of the earlier stages of nutritional disturbances in adults. Even in the fatal conditions of infants with marked nutritional and intestinal disturbances, the pathology of the intestine is obscure. Siegmund, in Henke and Lubarsch's Handbook of Pathology, takes nearly a page to discuss the difficulty in the differentiation of postmortem changes and artefacts from the true picture of the pathologic process. In forty-nine necropsy cases of atrophy of the pancreas in infants and children with clinical evidence of celiac disease Andersen described no abnormality of the intestine. It seems peculiar that such marked clinical and roentgenologic evidence of intestinal disturbances should be present without pathologic changes in the wall. Probably special methods of investigation are necessary to demonstrate early or relatively slight histologic changes which may be of profound physiologic importance. For example, the study of the intramural nerve cells, which undoubtedly play a part in intestinal physiology, requires special preparation of specimens. At the present time a satisfactory correlation of the disturbances demonstrable by X-ray and the pathologic findings, or the lack of them, is impossible.

ROENTGEN RAY MANIFESTATIONS

The abnormalities of form and movement found on X-ray examination of the small intestine in deficiency states appear to be different in different

FIGURE 4
DEFICIENCY STATE WITHOUT DIARRHOEA

The six-hour film discloses a gastric residue of at least one-third the barium meal, marked coarsening and irregularity of the mucosal folds of the duodenum and jejunum, uneven caliber of the small intestinal lumen, segmentation in the middle loops, and hypomotility as the barium has not yet reached the cecum. (It is difficult to select one film which gives an adequate picture of a small intestine study.)

Unit No. 528757. A twenty-nine-year-old woman came to the clinic complaining of epigastric and periumbilical pain of three months' duration with the loss of twenty pounds in weight. The onset occurred after a period of great anxiety. Later she had night sweats and increasing weakness. The clinician suspected the possibility of a peptic ulcer. The barium studies disclosed no evidence of peptic ulcer. The findings outlined above were interpreted as consistent with a deficiency state. Liver injections were followed by prompt improvement. Serial small intestine studies over a period of two years show that the jejunum apparently returned completely to normal but in the upper ileum markedly abnormal segmentation remains in spite of the fact that the patient is symptom free.

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stages of the disease, and even in the advanced cases they are variable. They may be conveniently assembled in three groups.

1. Motility.

   A. Hypermotility, apparently in the earlier stages.

   B. Hypomotility, in the advanced stages (Figures 3A, 3B).

   C. Dilatation, particularly in the jejunum in the advanced cases (Figure 3A).

   D. Abnormal segmentation, that is, elongated areas of contraction, suggesting spasm, between which the lumen may be normal in caliber or larger. The contractions may be so marked that no barium remains in the contracted areas, giving the effect of scattered separated boluses (Figure 5B).

2. Mucous Membrane.

   A. Coarsening of the mucosal folds, particularly in the duodenum and jejunum, meaning that they are wider, lower, and farther apart and, therefore, fewer in number (Figure 5A).

   B. Obliteration of the mucosal folds in the advanced cases, producing a smooth wall (Figure 3A).

3. Flocculation of the Barium Shadow.

   This is a coarsely granular appearance as if the aqueous suspension of barium sulphate were coarsely emulsified with some non-miscible fluid; it seems more likely to be present in the advanced cases (Figure 3B).

In well marked cases of primary deficiency states, hypomotility of the stomach is frequently found (Figure 4). It is manifested by a six hour gastric residue, unexplained by ulcer or pyloric obstruction, with sluggish ineffective peristalsis, and often with antral spasm. This may play a part in the production of flat blood sugar curves by delaying the expulsion of the ingested glucose solution into the small intestine where absorption takes place. With effective treatment the emptying of the stomach becomes normal.

EFFECT OF TREATMENT

Snell and Camp (1934) remarked that the appearance of the small intestine changes *toward* the normal as a result of treatment of chronic steatorrhoea. Snell (1939) states that proper treatment may be followed by a complete restoration to the normal in appearance. We have not as yet seen this happen in a case of well developed steatorrhoea (Figure 3C). Treatment of deficiency conditions in the earlier stages, however, may be followed by a return to normal as far as the appearance of the barium shadows is concerned. A study of our cases gives the impression that the ability of the small intestine to return to normal depends in part upon the duration of the trouble. It would seem that permanent irreversible changes occur if the condition exists long enough. The upper part of the small intestine seems to show earlier and more marked improvement than the lower part. Segmentation may persist in the proximal ileum after the jejunum appears normal.

FIGURE 5A
DEFICIENCY STATE APPARENTLY ASSOCIATED WITH AMOEBIC DYSENTERY

The mucosal folds of the jejunum are coarsened and widely separated, and the lumen is uneven in caliber. (One and one-half hours.)

Reëxamination of the small intestine at intervals after the institution of treatment is very instructive. The residual abnormalities may give a clue to the appearance to be expected in the earlier or milder

cases. In many instances objective improvement in the small intestine lags far behind clinical improvement.

FIGURE 5B
DEFICIENCY STATE APPARENTLY ASSOCIATED WITH AMOEBIC DYSENTERY

Typical segmentation is present in the middle and lower loops of small intestine with slight flocculation of the barium. (Three hours.)

Unit No. 523056. A forty-one-year-old business man, a resident of Mexico City for two and one-half years, one month before admission had a chill, headache, weakness and a slight fever for two days. Then followed severe diarrhoea—forty stools a day—with lower abdominal cramps, rectal burning and tenesmus. His local doctor reported the stools to be swarming with amoebae. The administration of emetine was followed immediately by cessation of pain but the diarrhoea persisted. He lost fourteen pounds in a month. The stools were pale and contained much neutral fat and no amoebae. Barium enema and proctoscopic examination disclosed nothing abnormal. The hgb., blood protein and calcium were normal. Basal metabolism was —21. The small intestine study, illustrated above, was interpreted as consistent with a deficiency state. With the administration of liver extract and Vitamin B complex the diarrhoea rapidly diminished and the patient became symptom free. It would seem probable that the deficiency state was precipitated by the acute amoebic dysentery, which was thought to be responsible for the continuation of the diarrhoea until the small intestine study disclosed evidence of a deficiency state.

DIFFERENTIAL DIAGNOSIS

The well-advanced changes in the small intestine —dilatation, smoothing of the wall, hypomotility, marked segmentation—have been observed in all forms of primary deficiency states, in hypoproteinemia, and in deficiencies produced by primary disease of the mesentery. The changes characteristic of the earlier stages—hypermotility, coarsening of the mucosal folds, hypertonicity and segmentation—can be produced in all of the above-mentioned conditions. They have been seen with tuberculous mesenteric lymphangitis and lymphadenitis. In one case temporary segmentation appeared when a patient became nervous and upset. Segmentation was described by Mills (1922) as the result of multiple peritoneal adhesions, but these segments, in my experience, are short and the mucosal folds are normal in size and distribution; the limitation in mobility of the intestinal loops can be easily demonstrated by palpation under the fluoroscope.

In true pernicious anaemia the small intestine pattern is normal.

At the present time a differential diagnosis of the type and the cause of a deficiency state based on the appearance of the intestine cannot be made.

COMMENT

As more attention is paid to the small intestine in routine gastro-intestinal examinations it becomes increasingly apparent that these small intestinal changes are recognizable in patients whose symptoms do not suggest any of the previously mentioned deficiency conditions. In a number of our cases the first suggestion that the patient might have a deficiency state came from the X-ray examination. These changes are frequently found in association with common, easily recognized diseases of the gastro-intestinal tract. The importance to surgeons of the recognition and correction of nutritional deficiencies is attested by the number of articles dealing with this topic in recent surgical literature.

Many workers on pellagra, sprue and beri-beri have pointed out that indefinite abdominal symptoms very frequently occur early in the course of the disease before its outstanding characteristic manifestations appear and before a clinical diagnosis can be made. Experience thus far seems to justify the assumption that a properly done roentgen examination of the intestinal tract in the early stages of these diseases would in many cases disclose disturbances

in the small intestine and thus assist in drawing attention to the possibility of a deficiency state before serious damage is done.

CONCLUSIONS

Diseases in which nutritional deficiency plays either a primary or a secondary role are relatively common. They are associated with disturbances in the physiology and morphology of the small intestine which are demonstrable by roentgen methods of examination. These disturbances are best demonstrated by special examination of the small intestine but often appear as a by-product of a routine gastro-intestinal examination for disease of the stomach or duodenum. They are recognizable not only in advanced but also in early cases. A satisfactory explanation of the mechanism of their production is not available at present.

Although a differential diagnosis cannot be made, the detection of these intestinal disturbances may serve to call attention to the presence of a deficiency state in cases in which the clinical picture is obscure.

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622 West 168th Street.

CANCER CONTROL IN VIRGINIA.

EDWIN P. LEHMAN, M.D.,*
University, Virginia.

Rising death rates from cancer offer evidence of the existence of a problem of rapidly increasing seriousness. Whereas the medical profession finds itself devoting more and more time and thought to the disease, the interest in cancer of the lay world is enlarging by geometrical progression. The problem rests, however, squarely in the lap of the profession; lay help is needed in financing the triple program of research, lay education and treatment, but the ways of expending available money—the strategy and tactics of the campaign against cancer—are solely the concern of doctors. They know what is known of the fundamental nature of cancer and they know abundantly its distressing manifestations in the patient, its effect on the daily lives of the sufferer and his family. They constitute the group that must in the first place educate the public in the early symptoms and in the second place be alert to detect the early signs. In the present state of our knowledge, no matter how vigorously investigation into the nature of cancer is being prosecuted, these two factors are the only first steps of importance in practical attempts to control the disease. Every practicing physician is on the firing line.

For this reason it has seemed desirable to a group of physicians who are active in the existing campaign against cancer in Virginia to present to the profession a detailed statement of that campaign and to suggest the relationship to it of every member of the Medical Society of Virginia. We are fortunate in this State in possessing a thoroughly established incorporated body, the Virginia Cancer Foundation, which is guided by the Medical Society of Virginia through its Cancer Committee. Around this organization all attempts at a wide program for cancer control should center. It is, in fact, an instrument of almost unlimited possibilities on which the medical profession can and should depend.

Unfortunately, as the result of a series of misunderstandings which need not be related here, a certain number of physicians in the State have expressed themselves as not being in complete accord with the aims or the methods of the Virginia Cancer Foundation. If this reaction among physicians is at all widespread, the cause of cancer control in the State is seriously handicapped. The campaign against the disease must be widely supported by the profession if it is to be in any degree successful, must indeed be an expression of the united wisdom of the profession. It is urged, therefore, that the following description of the work of the Virginia Cancer Foundation and of its relation to both the lay and medical world be carefully read and digested by every member of the Medical Society of Virginia.

The physicians active in the campaign, and particularly those that comprise the Cancer Committee of the Medical Society of Virginia, recognize that many steps in any cancer control campaign are experimental. Mistakes will be made and doubtless many have been made. Individual rights may seem to have been invaded and individual susceptibilities may have been wounded. For that reason there is published as an insert in this issue a questionnaire intended to uncover mistakes and to learn from sources of wisdom not yet tapped. It is requested that every member of the Society, after familiarizing himself with the below data, fill out and mail the questionnaire according to the instructions there given.

GENERAL CONSIDERATIONS

The Virginia Cancer Foundation was incorporated in 1938 under the laws of the State of Virginia as a non-profit corporation. Wisely its founders provided for its activity in any form of work directed towards the control of cancer, including the establishment of research institutions and hospitals for the treatment of cancer. This extended program is, of course, a matter for the future. As a start towards the control of cancer in the State, the Foundation has begun with what have seemed the most urgent necessities, namely, the medical care of cases of cancer which present some hope of cure and the education of the lay public in the prevention and the early detection of cancer. Other objectives must soon be considered if the Foundation is to go forward as an effective instrument against cancer.

*Chairman, Cancer Committee, Medical Society of Virginia; Chairman, Virginia Section, American Society for the Control of Cancer; Director, Virginia Cancer Foundation.

The duties and privileges of the two groups interested in the control of cancer, namely, the profession and the laity, have been weighed in developing the organization. After some experience, the Foundation recognized that at its inception the dominant place of the medical profession in the control of cancer had, perhaps, not been sufficiently appreciated. Through alterations in organization this possible fault has now been corrected to a degree that is believed to be adequate.

The Board of Trustees consists of a mixed group of lay and professional individuals of which 40 per cent may be physicians. The By-Laws state that the appointment of any physicians to the Board of Trustees shall be made on recommendation of the Cancer Committee of the Medical Society of Virginia. This Committee has interpreted this provision so as to include not only a group of physicians who are interested in cancer, but also the personnel of the entire Cancer Committee of the State Society. In other words the proceedings of the Board of Trustees are under the direct supervision of the Medical Society of Virginia. Although no controlling vote is given to the profession in the Board of Trustees, the obvious preponderance of authority and interest that the medical profession will exercise over its deliberations, is expected to outweigh the numerical minority. It was felt that the lay group involved might lose interest if the organization were made predominantly medical.

The function of the Board of Trustees is largely that of establishing general policies, of assuming responsibility for possible funds of the Foundation, and of reviewing and endorsing the actions of its Executive Committee. It has the usual complement of officers with the addition of a Director, who must be a physician, and who acts as Chairman of the Executive Committee. It also is provided with a Finance Committee to which is delegated the authority for the care and investment of endowment funds, the accumulation of which is of course one of the early major projects of the Foundation.

The association between the medical profession and the Virginia Cancer Foundation is made still closer by the fact that the active body, namely, the Executive Committee, is appointed by the President of the Foundation upon the recommendation of its physician-director. This body meets several times a year and is empowered to commit the Foundation to policies and procedures while the Board of Trustees is not sitting. Its membership at present includes, and is intended permanently to include, the entire membership of the Cancer Committee of the State Society.

Through agreement with the American Society for the Control of Cancer, the national organization devoted to similar aims, the Virginia Cancer Foundation represents that body in Virginia. Its Director is the Chairman of the Virginia Section of the American Society for the Control of Cancer. Through this affiliation, the Virginia Cancer Foundation is related to the nation-wide effort. More particularly, it is thereby able to command the services of experienced speakers on cancer and to obtain literature designed for the education of the laity at relatively slight expense.

Any campaign against cancer must unite education of the lay public in regard to cancer with improvement in the facilities for its treatment. A third essential is the provision of funds for the accomplishment of these ends. Unlike most charity enterprises efforts to raise money can be, and, under the precedent of the American Society for the Control of Cancer, are combined with the educational campaign. The Virginia Cancer Foundation has adopted a program in which education and the provision of funds by public subscription are associated. An effort is made to continue this program throughout the year; but the culminating activity occurs in April of each year which the American Society for the Control of Cancer devotes to a national educational campaign as Cancer Month. The State campaign is carried out by an additional officer, paid by the Foundation, namely, the Financial Director. This individual is appointed also by the American Society for the Control of Cancer as its State Commander of the Women's Field Army, which is the organization devoted throughout the country to these two purposes.

From the money raised during the educational campaign a proportion to be further discussed is devoted to education during the ensuing year, most of the remainder being allotted for the care of indigent cancer patients.

One further policy of the Virginia Cancer Foundation should be noted. The Foundation has felt that it could not justifiably ask for public support unless it could affirm that within reasonable limits publicly subscribed money spent for the care of in-

digent cancer patients is properly spent. At the suggestion of the Cancer Committee of the Medical Society of Virginia, it has, therefore, agreed to spend such funds only at institutions of which the Medical Society of Virginia could approve as having the equipment and personnel that make proper treatment possible. The Cancer Committee of the Medical Society of Virginia has established a set of minimum requirements (see VIRGINIA MEDICAL MONTHLY, September, 1940, page 564) which must be met. To institutions meeting these standards and applying for the treatment of patients from publicly subscribed funds (and only to such institutions) will the Virginia Cancer Foundation send patients for treatment. In all public statements in this connection it has been made clear that institutions not so accredited are not thereby adjudged necessarily incapable of treating cancer. Six medical centers have applied for certification and have been certified, but there are many more in the State, which either have not been interested in treating indigent patients, or for some other reason have not yet applied, all of which are undoubtedly offering adequate treatment of the disease. An effort is being made to assure the geographic spacing of accredited clinics so that no patient need travel any long distance to be assured of treatment.

In summary then, the Virginia Cancer Foundation is an organization under the direct supervision and partial control of the Medical Society of Virginia, which is attempting to begin an effective attack on cancer in Virginia. This attack consists of a campaign of lay education, the expenses of which are borne by money publicly subscribed during a campaign which combines efforts to obtain money with the educational program itself. In addition it attempts to furnish funds for the treatment of indigent cancer patients at properly accredited centers. Its work is closely affiliated with the national effort represented by the American Society for the Control of Cancer, of which it is the Virginia representative.

EDUCATIONAL PROGRAM

For those physicians, whose opinion, either critical or commendatory, the Cancer Committee of the State Society is anxious to obtain, it is necessary to present in some detail the past experience and the current operative methods of the Foundation, as well as its broad general program. Insofar as the educational campaign is concerned, little detail need be given. Through the activity of the Commander of the Women's Field Army, the State is organized in districts which are further subdivided into cities and counties. In each of these subdivisions a representative of the Women's Field Army is appointed whose duty it is to arrange public addresses, radio talks, moving picture presentations and the distribution of printed educational material prepared by the American Society for the Control of Cancer and delivered from the central office. There is being developed throughout the State a Speakers' Bureau on which these women may call for addresses by physicians to lay audiences. The Cancer Committee of the State Society is grateful to all physicians who have given such talks and who may be asked in the future to serve.

The activity of these local units depends, of course, entirely upon the interest and enthusiasm of the local representative of the Foundation. It has not been an easy task to find women everywhere who can and will work equally vigorously and tactfully. The physicians of the State need not be reminded that many of these women have had no extended contact with the profession and are not familiar with the reasons for certain professional points of view. Unquestionably antagonisms have arisen from lack of understanding on the part of some of the local representatives. It would be helpful if instances in which physicians were embarrassed were to be reported to the Cancer Committee of the Medical Society of Virginia. Such a proceeding would tend to further the cause of cancer control in Virginia more successfully than to condemn the efforts of the Virginia Cancer Foundation on the basis of mistakes which it is hoped are isolated. The physicians of the State may be assured that the Director of the Virginia Cancer Foundation is making every effort to minimize such occurrences and to clarify misunderstandings.

It is natural that the chief educational effort of the Virginia Cancer Foundation should be synchronous with that of the national body; namely, that April should be cancer month in Virginia as it is in other states. On the other hand, as the State organization becomes more accustomed to its activities, it is hoped that educational efforts will be made throughout the year. In certain communities the educational campaign has been completely overshadowed by local charity drives of longer standing. In such instances it is possible that the efforts of the Virginia Cancer

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Foundation can culminate during some other month; and in several instances this has already been done.

PROGRAM FOR FURNISHING TREATMENT TO INDIGENT PATIENTS

The efforts of the Virginia Cancer Foundation in relation to the care of the indigent cancer patient are complex. They comprise several factors: (1) the furnishing and allocation of funds, (2) the choice of type of patient to be benefited, (3) the mechanism of bringing the patient into relationship with the Foundation, (4) the furnishing of adequate treatment, (5) proper records both financial and clinical.

1. Money to be applied to the care of indigent cancer patients is derived from the funds collected during the educational campaign. In general the total amount collected is applied to four needs. The first is the Virginia share of the support of the American Society for the Control of Cancer. Ordinarily the state divisions of this organization are required to pay 30 per cent of all collections in the state to the American Society for the Control of Cancer. On account of the origin of the Virginia Cancer Foundation as a separate body from the American Society for the Control of Cancer, the latter has generously allowed the establishment of a particular arrangement in Virginia different from that elsewhere. The cost of membership in the Virginia Cancer Foundation is one dollar. Thirty per cent of this goes to the national office in New York; but if any larger sum is given, the first dollar only is considered as a membership and thirty cents is allocated to the national office. During the two years in which this arrangement has been in effect, the amount sent to New York has been almost exactly 15 per cent of the total collections in each instance. This amount is returned to the Virginia Cancer Foundation in kind through the furnishing of educational material at cost, free publicity material and the availability of experienced speakers for meetings in the State.

The remaining 85 per cent is budgeted by the Executive Committee of the Virginia Cancer Foundation for (a) the support of the office of the Foundation, (b) the educational campaign and (c) the care of indigent cancer patients. In the fiscal year 1939-40, 50 per cent of this remainder was used for the care of indigent cancer patients and during the current year this proportion has been raised to 65 per cent, amounting to $8,440.41. No remuneration is paid to any physician serving either in an administrative capacity or in the care of patients.

In the hope that more interest would be taken in the money-raising compaign and that greater sums might thereby be obtained, the Foundation early established the principle of allowing available money to be spent only on patients from the locality in which it was raised. In view of the facts that first, many localities raised nothing and many too little to apply to the care of indigent cancer patients; second, that numbers of appeals had to be turned down for these reasons; third, that other localities did not make use of the entire sum available; and fourth, that thereby a considerable surplus of unused money was available at the end of the last fiscal year, the Executive Committee of the Foundation has modified this policy so as to permit the allocation at the end of each fiscal year of any locally unused funds for use anywhere in the State. This means that the patients from poor counties need no longer be neglected by the Foundation. This sum will first become available on July 1, 1941.

At the present time the Foundation is faced with a situation which the doctors of the State should know. In spite of assuming financial responsibility for the treatment of every case which comes under the provisions to be detailed below, it is possible that a considerable amount of the money allocated for this purpose during the last two years will not be spent. The Director does not believe that this situation is due to a lack of cancer cases that should be treated; it is more probable that it is due to a combination of patient ignorance and lack of appreciation by the profession of the State that this service is available. Having yet no considerable central fund for use anywhere in the State, it is possible that during the present fiscal year, up to July 1, 1941, applications may still have to be refused, but it is hoped that beginning on July 1, 1941, every appeal can be met.

2. The regulations under which the money is spent on patients from the localities in which it is raised, represent policies to which the Foundation has given considerable thought. It has been recognized from the start that the fundamental aim of the Foundation is the diminution of deaths from cancer and not the broader aim of diminishing human suffering when cancer is the cause. The latter seems to be the duty of less specialized organizations, such as local welfare bodies and churches. It is quite

obvious that the available funds of the organization could be rapidly dissipated if they were to be applied to the hospitalization or the palliative treatment of the dying cancer patient, without subtracting at all from the number of cancer deaths. For that reason the Foundation has established the rule that funds should be spent only for the care of patients in whom the disease is not obviously hopeless. It has, therefore, not accepted cases with distant metastases, with ascites or other evidences of hopelessness. On the whole, however, the rule has been liberally interpreted in that cases have been accepted with any degree of local spread or regional metastasis. Furthermore, the Foundation has accepted the responsibility for the treatment of cases once previously treated no matter how hopeless the later state may be. These conditions, together with the obvious requirement that the patient should be certified by local agencies as being definitely indigent, are the only rules of choice of patients.

3. The mechanism by which such patients are brought into relationship with the Foundation is often cumbersome, but in certain instances it has been possible to modify it so that quicker action is obtained. The cancer case may come to the attention of the local physician, the local representative of the Virginia Cancer Foundation, the welfare worker, the health officer or any other individual in the community. Whoever becomes aware of the existence of such a case may write directly to the Executive Secretary of the Virginia Cancer Foundation to receive instructions. Preferably, however, he or she will approach the local representative of the Virginia Cancer Foundation, who will then investigate the case from two aspects; first, as to the presence of proven or suspected cancer and second, as to indigency. She will then arrange to have the patient examined at the nearest certificated cancer clinic. In the event that cancer is present or is suspected, this clinic will notify the central office, which will by that time have heard from the local representative as to the patient's indigency. On the basis of this information authorization for diagnosis and treatment under the auspices of the Foundation will be promptly forwarded. In order for the Virginia Cancer Foundation to be certain that money is not being spent when it is unavailable, it is important that the approval of the case should go through the Director's office, before treatment is instituted. With prompt action on the part of everyone concerned this mechanism can usually be made effective and treatment can be started within four or five days. In the case of emergencies, such as severe uterine bleeding, authorization will be given after treatment has commenced. It is important that the doctors of the State know how to obtain help from the Virginia Cancer Foundation in their indigent cancer problems. Briefly, if the physician knows the local representative of the Virginia Cancer Foundation, he should approach her. If he does not know who this may be, he should write to Miss Eleanor McK. Gibson, Executive Secretary of the Virginia Cancer Foundation, University Hospital, Charlottesville, Va. If this latter method is followed, it is urged that certain minimal data be included so that the Director may have some conception of the problem. The age, sex, and race of the patient and the site of the cancer should be furnished as well as the city or county of residence and the patient's financial status.

4. After diagnosis and treatment have been authorized the next problem of the Virginia Cancer Foundation is the assurance to the patient and to the donors of funds that such diagnosis and treatment will be adequate. As stated above the Foundation has put this problem in the hands of the Medical Society of Virginia through its Cancer Committee and has agreed to furnish funds for treatment only at centers certificated by that body under previously published standards. At the time of writing six such clinics have been certified, as follows:

Diagnostic Tumor Clinic, 306 West York Street, Norfolk, Va.*

McIntire Tumor Clinic, University Hospital, Charlottesville, Va.

Petersburg Tumor Clinic, 30 Franklin Street, Petersburg, Va.

Tumor Clinic, Elizabeth Buxton Hospital, Newport News, Va.

Tumor Clinic, Jefferson Hospital, Roanoke, Va.

Tumor Clinic, Medical College of Virginia, Richmond, Va.

***In spite of its title, this clinic is accredited for treatment as well as diagnosis.**

It is believed that others will be certified within a few months. Doctors can, of course, refer indigent patients directly to these clinics, but such a procedure is apt to cause confusion and delay, as the physicians at the clinic will have had no authority from the office of the Foundation for the treatment of the particular patient and will not know whether funds are available.

The Virginia Cancer Foundation has protected

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its funds through establishing a standard set of costs for cancer care. These have been made possible by the whole-hearted cooperation of each of the certificated clinics and they represent a definite financial contribution on the part of the clinics to the cancer control program. The associated hospitals have in every instance agreed to hospitalize patients at a flat rate of $3.00 a day including all hospital charges, a sum which, of course, in few hospitals covers the patient-day cost. The radiological departments have agreed to give a complete course of deep therapy at a maximum cost of $25.00, with a shorter course at a proportionate rate. Lastly, the clinics have agreed to the use of radium with no cost. This means that in a consecutive series of thirty-six cases treated the average cost per patient to the Foundation was only $40.84.

In order to be more effective in diminishing cancer deaths the Executive Committee has established the policy of assuming the cost of diagnosis in cases in which cancer is suspected, although not proven, provided the opinion that cancer can not be excluded is concurred in at a certificated clinic. An extreme example of this type of expenditure is that for hospitalization in the case of a suspected cancer of the stomach to be excluded only by exploratory laparotomy.

No charges for home care, for dressings or drugs, or for transportation to and from the clinics is assumed by the Foundation. When ambulatory patients are receiving X-ray treatment at certificated clinics not in their home communities, the Foundation has assumed the cost of board and lodging during the period of treatment.

5. Lastly, an object of the Foundation has been to publicize its proceedings and its financial policies as completely as possible. The proposed use of subscribed money has so far as possible been predicted during the campaigns to raise money; and after the close of each fiscal year a detailed statement covering the actual financial transactions of the previous year has gone out to every local representative of the Foundation. This has included a complete balance sheet stating (1) the previous year's balance, (2) the total collections, (3) the sum paid to the American Society for the Control of Cancer and the percentage of the total income that it represents, (4) expenditures for the operation of the office of the Foundation, (5) expenditures for the educational campaign, (6) the amount spent for indigent cancer patients, and (7) the balance remaining at the end of the year divided in accordance with the budget. In addition data concerning the indigent patients treated are reported, together with the average cost. With this report is sent a copy of the regulations for the care of indigent cancer patients and a diagram showing the organizational pathways through which patients must pass to benefit from the services of the Foundation.

In order to complete properly such a report an elaborate system of records has been established in the central office. These include a separate financial statement for every locality which has shared in the cancer control campaign, an individual folder and card in the files for each patient treated, as well as the ordinary minutes of the Executive Committee meetings and account books. These records are open to the inspection of any interested individual. All financial records are audited at the close of each fiscal year by a certified public accountant.

One other record is kept which is not specifically the function of the Virginia Cancer Foundation but rather that of the Cancer Committee of the Medical Society of Virginia. For each case treated there is placed in the file of the latter body, a report to be filled out by the Director of the clinic on a specially prepared form, including clinical data with signed opinions of the surgeon, the radiologist and the pathologist. This record has a twofold purpose. It enables the Cancer Committee of the Medical Society of Virginia to obtain some idea of the character of the treatment given at the accredited centers. In addition it is hoped that possibly significant data on a large group of cases of cancer can ultimately be obtained.

CONCLUSION

The general problem faced by the Virginia Cancer Foundation and by every physician in the State is immense and will so remain until the cause or causes of cancer are most clearly defined and specific therapy becomes available. In the meantime it is clear to all physicians that the diminution of the number of deaths from cancer depends at the least upon the two approaches which the Virginia Cancer Foundation is now making, namely, education in regard to the disease and improvement of the facilities for treatment. So long as lay individuals are ignorant of the symptoms of cancer or fear treatment more than they fear the disease, the provision

of improved opportunities for treatment is relatively useless. The two activities must go hand in hand.

It is recognized that a program of lay education on any medical topic carries with it certain disadvantages, which are perhaps seen in their most exaggerated form in education about cancer. The danger of creating cancerphobia cannot be overlooked. Whether or not a seriously intense element of fear will follow lay cancer education depends on two factors, namely, the type of person educated, and the type of education. There is a large group of individuals who live in a fear-state constantly. It is probable that most of these people live in fear of cancer just as they live in fear of economic disaster and of personal injury. It can be doubted that the presentation of known facts about cancer will always be harmful to this group. Certainly a number of people whose fear of cancer is engendered by complete ignorance of the disease will be convinced that their fears are unjustified. In any general statement about this problem one cannot be dogmatic in relation to the individual. No doubt some people will be harmed; but if certain of those same people are prevented from dying from cancer, the additional fear might be a price worth paying. If that fear drives them to a doctor, who can reassure them of the absence of cancer, it may evaporate.

The other element depends upon the physician's approach to the problem in presenting it to the lay world, either individually or in groups. The doctor can point out that cancer is only one of many hazards of living and that the ordinary individual does not live in constant fear of all the dangers of living. He takes such precautions as protecting himself from infection following a wound, from a rickety ladder and from the hazards of driving an automobile, without the intense emotional reaction which is often associated with the fear of cancer. After all, a tactful physician can teach the simple precautions against cancer and the suspicious symptoms that may indicate cancer without implanting in the minds of his hearers the idea that they are probable immediate victims.

No matter what may be said theoretically about this problem, the experience of the American Society for the Control of Cancer and of most practicing physicians indicates the value of the educational campaign. In a recent conversation with a physician from a state where much more active education has been carried on than in Virginia, the remark was made that the incidence of late cancer of the breast had very definitely diminished. As a result of three years of cancer education in Virginia, the number of patients that are coming for reassurance in regard to cancer is increasing. In some of these, of course, cancer is found in an early stage. The full proof of the value of cancer education in Virginia will come later, if through active educational efforts over a period of years, the incidence of cancer deaths in Virginia is favorably affected. It does not seem logical to refuse to support this experiment on the theoretical grounds that a few people will be hurt. It becomes increasingly clear that if the sum total of the nation's educational campaign against cancer were harmful there would be a definite tendency to diminish efforts, rather than the opposite tendency which now exists.

In conclusion, the Cancer Committee of the Medical Society of Virginia and the Virginia Cancer Foundation ask the enthusiastic support of the profession and the benefit of its wisdom in their attempts to diminish cancer deaths in the State. It is ultimately, to repeat, the doctor's job; and these organizations exist to help him.

EFFECTS OF QUININE AS A PROPHYLACTIC VERSUS INFLUENZA AND PROBABLE REASON.*

A. M. SHOWALTER, M.D., F.A.C.S.,
Christiansburg, Virginia.

My attention was first attracted to the use of quinine in diseases of the respiratory tract in 1907, while an interne at St. Vincent Hospital, Norfolk, Virginia, where some of the staff men used large doses of quinine sulfate in the treatment of pneumonia, with apparently gratifying results. Following this, I used quinine a great deal in the treatment of pneumonia and it appeared to me that the results

*Read before the Montgomery County (Va.) Medical Society, September 25, 1940.

were better than any drug available, until the advent of serums and more recent drugs.

During the epidemic of influenza in 1918, I *personally* had occasion to try 30 grains daily after breakfast, while running a temperature of 103 and 104, and was surprised to find that I not only felt better after taking these doses, but my temperature came to normal at the end of seventy-two hours and I did not miss a day's work, or suffer any ill consequences as a result of the treatment or disease. Having no intelligent answer to give to the question asked by the *public* many times a day, how to prevent influenza, and having twelve employees in the small hospital I then operated, all young people and apparently easy victims to this particular epidemic, I decided to try quinine as a prophylactic. I ordered every one of the twelve to take 10 grains quinine sulfate as a prophylactic, daily after breakfast, except those on night duty, and they in turn were to take the same amount after the evening meal. The result was so startling that I have been following the idea ever since in my practice. While practically every business of any kind in our community was closed out on account of illnesses and deaths, not one of our employees ever took the "flu" at any time and not a day was lost from work. Whether this would be true in any other epidemic of influenza I do not know, but if one ever occurs in this community I will certainly try this again unless in the meantime a safer and better means is found.

The results obtained in the treatment of influenza with quinine outside of my own case were not satisfactory, because by the time I found out this much about the disease and treatment, the epidemic had reached such proportions that a patient seldom lived long enough to give any treatment satisfactorily. In those that did live as long as a few days, however, the results appeared to be good. However, it was with the *contacts* that I felt assured we obtained the best results. I prescribed quinine as a prophylactic to hundreds of cases during the late stage of this epidemic and as far as I was able to determine very few of those who took quinine as directed took influenza, and if they did the disease was rather mild. I am unable to say if there were any deaths, on account of the rush, and we had little time to make detailed study as to why these results were obtained.

Knowing, however, that the first thing that happened with a person stricken with "flu" was a rapid and marked *leucopenia*, it occurred to me that the quinine probably had its good effect by increasing the white cell count. With this thought in mind, I have on numerous occasions during the past twenty-two years used quinine for diseases of the respiratory tract, especially where the white count was normal or below, and wherever I have been able to follow up these cases there has been almost a universal increase in the white cell count, with marked improvement in the clinical condition of the patient.

My idea in using quinine in the morning instead of during the day or at night is suggested by the stimulating effect of quinine, which lasts over a long period of time, about twelve hours, and is generally followed by a reaction during the next twelve hours. This, in my opinion, is particularly important for patients who are up and about, to prevent taking fresh cold or extension of trouble in the respiratory tract.

In order to further clarify this point, I wish to submit the following report of work done in the Clinic of the New Altamont Hospital, Inc., Christiansburg, Virginia, during the years 1939 and 1940.

Group A. Radford College, by Dr. Fitzpatrick and Miss McCraw—

Before Quinine	Total W. Cells	Average W. Cells
11/14/39—12 pts.	113,450	9,454 plus
11/21/39—11 pts.	115,350	10.486 "
11/28/39— 8 pts.	76,150	9,518 "
Summary 31 Counts—Total	304,950	9,837 "

Group A. After 3-5 gr. Quinine Sulphate Daily, A.M., P.C.

After Quinine	Total W. Cells	Average W. Cells
12/18/39—8 pts.	103,950	12,993 plus
1/ 4/40—9 pts.	94,250	10,472 "
1/13/40—8 pts.	80,050	10,006 "
Summary 25 Counts—Total	278,250	11,130 "

Group B. Christiansburg Industrial Institute from November 29, 1939, to January 11, 1940.

Before Quinine	Total W. Cells	Average W. Cells
11/29/39—50 pts.	350,600	7,012 plus
12/ 6/39—50 pts.	400,700	8,014 "
12/13/39—53 pts.	455,600	8,596 "
Summary 153 Counts— Total	1,206,900	7,888 "

Group B. After 3-5 gr. Quinine Sulphate Daily A.M., P.C.

After Quinine	Total W. Cells	Average W. Cells
12/20/39—49 pts.	399,800	8,159 plus
1/ 4/40—38 pts.	318,200	8,373 "
1/11/40—38 pts.	318,100	8,371 "
Summary 125 Counts—Total	1,036,100	8,288 "

Group C. New Altamont Hospital—11/15/39 to 12/20/39.

Before Quinine	Total W. Cells	Average W. Cells
11/15/39—23 pts.	161,900	7,037 plus
11/22/39—24 pts.	197,550	8,231 "
11/29/39—23 pts.	188,000	8,173 "
Summary 70 Counts—Total	547,450	7,820 "

Group C. After 3-5 gr. Quinine Sulphate Daily A.M., P.C.

After Quinine	Total W. Cells	Average W. Cells
12/ 6/39—21 pts.	190,200	9,057 plus
12/13/39—16 pts.	131,950	8,246 "
12/20/39—13 pts.	107,000	8,230 "
Summary 50 Counts—Total	429,150	8,583 "

Statistical comments on white cell counts incident to use of quinine: These people had 3-5 grains after breakfast daily, depending upon their susceptibility.

1. A study during the months of March and April, 1939, of 10 cases shows the following—

Average first count before Quinine of 10 cases ---------- 7,340
Average first count week after 5 gr. Quinine daily A.M., P.C. ---------- 8,990—Increase 1,650

Average first count of 3 weeks Quinine treatment as above ---------- 8,666—Increase 1,326
Polymorphonuclear count in this group of 10—count before Quinine ---------- average 59.5
Polymorphonuclear count in this group of 10—1 week after Quinine ---------- " 59.4
Polymorphonuclear count in this group of 10—3 week average after Quinine ---------- 59.87

2. These groups studied November 15, 1939—January 15, 1940, over a period of 3 weeks before and 3 weeks after Quinine administration show the following facts:

85 patients averaged 1 week before Quinine a white cell count of ---------- 7,364
78 patients averaged 1 week after Quinine a white cell count of ---------- 8,896—Increase 1,532

Of this group 254 counts before Quinine—over 3 weeks period, average ---------- 8,107
Of this group 200 counts after Quinine—over 3 weeks period, average ---------- 8,717—Increase 610

3. Below a study of 21 cases from January 15, 1940—May 1, 1940, these patients having one count only before Quinine and 2-3 counts after administration of 3-5 grs. Quinine daily after breakfast—results follow:

Average count before Quinine of 21 cases ---------- 8,304
Average count after 1 week Quinine, 21 cases ---------- 9,840—Increase 1,536

Average count for 3 weeks Quinine 17 cases ---------- 9,116—Increase 812

It is rather significant to note that in these three different groups made at different times the first week increase after use of Quinine is so uniformly the same:

1st group an increase of ---------- 1,650
2nd group an increase of ---------- 1,532
3rd group an increase of ---------- 1,536

While over the 3 weeks period there is a rather sharp discrepancy between the first and last two as follows:

1st group after 3 weeks average ---------- 1,326
2nd group after 3 weeks average ---------- 610
3rd group after 3 weeks average ---------- 812

The differential count was made only in the group of 1939, or first group, and it is significant where there was a variation either up or down in the polymorphonuclear count, the small lymphocytes either increased or decreased, according to decrease or increase of polys. The differential count averages practically the same in all counts, as schedule shows.

Second Group: November 15, 1939–January 15, 1940. Eighty-five cases studied over a period three weeks before and three weeks after use of 3-5 grains quinine daily A.M., P.C. This survey was made in three groups, namely: One, Radford College, Radford, Virginia.; One, New Altamont Hospital Clinic, Christiansburg, Virginia; The other, Christiansburg Industrial Institute (col.), Christiansburg, Virginia, in order that we might make a comparison of the several different groups of life. It is interesting to note that the average in all three groups of the first count made, compared to the average over three weeks, were as follows: first—9,454 vs. 9,837; second—7,012 vs. 7,888; third—7,037 vs. 7,820. First group also shows count before quinine 9,454 vs. 12,993 count one week after quinine was started; second groups shows count before quinine 7,012 vs. 8,159 count one week after quinine was begun; third group shows count before quinine 7,037 vs. 9,057 count one week after quinine was begun. It should be observed in groups one and three, white people, there was an increase of about 33⅓ per cent in group one, from the first count before to first count after

quinine; and about 30 per cent increase in group three; while in group two of colored people there was an increase of about 16 per cent.

The following figures show complete details of our observations, with exceptions:

Third Group: January 15 to May 1, 1940. Three-five grains quinine daily A.M., P.C. shows twenty-one cases studied, one count only being made before quinine was started, and three after. First count before quinine 8,304 vs. first count after quinine 9,840, an increase of nearly 20 per cent; while the average over three weeks was 9,116, showing an increase over first week before (8,304), vs. 9,116 average after, about 10 per cent.

June 1, 1940: In answer to an inquiry, of the 123 patients above reported, we find

54 had no cold or "flu";
42 had cold or "flu" but lost no time;
15 had cold or "flu" and did lose a few days time:
12 failed to report.

123

None of the 112 cases reporting advised having pneumonia or serious complications.

Comments on effects of quinine in sickness and health, by medical authorities with reference to bibliography.

Bastedo[1] says: "In ordinary therapeutic doses of quinine, there is probably a slight increase in the rate of the heart and a tendency to rise in the blood pressure, from mild stimulation of the heart muscles and of the arterial muscles."

Quinidine, an alkaloid of cinchona, is said to have the same effect on the heart muscles as a stimulant, but more marked than quinine.

Cecil's textbook of Practice of Medicine[2] has this to say with reference to influenza: "There is a leucopenia in most cases."

Osler-McCrae's Practice of Medicine[3] on the subject of blood picture in cases of influenza, has this to say: "During the epidemic of 'flu' in 1918, leucopenia was the rule in broncho-pneumonia."

Geo. B. Roth,[4] University of Michigan, has, in substance, this to say: "Gives brief history of work by Binz, Wilkinson and Askenstedt and then shows by his own experiments that the effects of quinine in ordinary therapeutic doses produces—1. A leucocytosis, with increase of lymphocytes coming on shortly after administration, thought to be due to contraction of the spleen and other blood harboring structures; 2. An hour or two later a leucopenia occurs, mostly from reduction of lymphocytes; 3. Following shortly after the second, there is a leucocytosis, mostly an increase of polymorphonuclears—adding that the leucocytosis may come from the chemical stimulation of disintegrated white blood cells of the body on the blood forming organs."

Wilford H. Manwaring and Harold O. Ruh,[5] on the subject "The effects of certain surgical antiseptics and therapeutic agents on phagocytosis—carbolic acid— mercuric chlorid—boric acid—quinine hydrochloride"—says: "The addition of quinine hydrochloride gives from the first an increase in phagocytosis, reaching a maximum (20 per cent), with a concentration of 1/200 per cent; reduces to normal with concentration of 1/120 per cent; ceasing entirely when concentration of 1/40 per cent is reached."

Public Health Reports[6] contains reports of polymorphonuclear increase in bronchial areas of mice inoculated with influenzal virus.

Use of quinine in surgery and obstetrics by Welcker and Smit[7] present a series of practical observations on the apparently universal value of quinine as a prophylactic and curative agent in treatment of influenza.

U. S. Disp., 22nd ed.:[8] Quinine causes a pronounced leucocytosis when taken in ordinary therapeutic doses.

Dr. Winckel's reference[9] to observations of Hughes and Shrivastava states, with reference to the use of quinine in malarial patients, that "There was at first an increase in the total number of leucocytes, mostly mononuclears, followed by leucopenia, which again disappears when quinine treatment is resumed."

Lemetayer,[10] on the subject: "Action of quinine on leucocytosis and the production of specific antitoxin in horses during antitetanic hyperimmunization" concludes that "The leucocytosis which he shows occurs in normal horses taking quinine does not oppose leucocytosis in horses subjected to hyperimmunization with tetanus toxin * * *."

Fritz Johannessohn[11] on the subject: "Action of quinine on the blood," states that use of quinine hydrochloride .3 grm. daily with .9 grm. on every seventh day for protection *vs.* malaria—examinations every eight to ten days for four weeks—followed by some quinine free-weeks, to be followed by a second period of quinine treatment, which was consid-

erably longer, found that certain individuals had no alteration in leucocyte counts, either in first or second periods, while in other cases there was a definite decrease in number of white cells. When quinine is discontinued, the cell count gradually returns to normal in two to three weeks, the decrease to low point requiring three to four weeks quinine treatment. If, however, small doses—.3 grm. quinine—are given to those patients showing a decrease, the number of white cells slowly returns to normal. Of approximately 1,000 cases treated, 300 showed leucopenia, while 700 did not.

From the Department of Research in Pure Chemistry, Mellon Institute of Industrial Research, Pittsburgh, Pennsylvania, by C. L. Butler, W. L. Nelson, Alice G. Renfrew and Leonard H. Cretcher,[12] we note the statement: "Many physicians believe that the best way to treat pneumonia is by attacking the pneumococcus directly." From their experiments they show that hydroxyethylhydrocupreine sterilizes pneumococci *in vitro* in a concentration of 1:200,000, and that it is far less toxic than optochin (ethylhydrocupreine) and highly efficient in protecting mice again pneumococcic infection. See Bibliography 11.

Professor Kalk,[13] together with Professor Von Bergmann, of Berlin, observed 2,000 cases of pneumonia by parenteral use of quinine-calcium and a decrease in mortality is shown from 23 per cent to 16 per cent, while in the Army Hospitals the decline in mortality had been from 9.8 per cent to 4.9 per cent. Out of 60,000 injections of quinine-calcium, there were only seven cases of local abscesses. He thinks the results of quinine-calcium treatment of pneumonia have been much better than those treated with pneumonia serum. (Quinine-calcium for parenteral use by Sandoz Chemical Co., New York)—See Bibliography 12.

Arthur MacDonald[14] describes a large English boarding school at which the Head Master had all the pupils given two grains of quinine every morning, with the result that there was practically no influenza among them, whereas the day pupils to whom no quinine was given suffered very much from this illness. Another example is that of a girls' school, in which all the girls were given two grains of quinine every morning, and the servants were not given any. Result: hardly any cases of influenza among the girls, while all the servants came down with it.

Dr. A. H. Dodd,[15] having tried one or two grains of quinine daily in morning for himself, was so well pleased with the results that he recommended its use in a boarding school during one of the worst influenza epidemics ever known; there was not a single case of it at the school.

Dr. F. Scheitz[16] believes that the good effect of quinine in preventing influenza is due to the vasodilatory effect on the mucous membranes, thereby heightening the power of self-protection in the tissues.

Professor K. Laubenkeimer[17] states that quinine has proved itself a prophylactic, upon the effectiveness of which one can rely. During the year 1918 he noted during that epidemic 1,000 prisoners of war were kept almost entirely free from the disease while taking four grains quinine daily, and during the same time a number of those not treated were very sick.

Berger,[18] observing effects of four grains quinine twice daily on a group of 173 nurses combining the quinine with an equal amount of sodium salicylate, states the results were so good that practically no new cases occurred after the treatment was begun, even though the epidemic had not as yet reached its maximum severity. Also, the cases that did occur after taking the drug were much less serious. He further notes that malarial patients taking quinine are not attacked by influenza.

Vico[19] mentions an influenza epidemic which broke out in a hospital in Italy, and to which all persons connected with this institution succumbed, with the exception of 400 malaria patients, who were under the influence of quinine.

Gladstone[20] states that after fifteen years experience with quinine for influenza he considers it as much a specific for influenza as it is for malaria. During the 1918 epidemic he gave two grains every two hours and found the results very striking. Cases that were stuporous became quite bright in twenty-four hours after taking two grains every two hours.

Alexander Sterling,[21] in an article on "Quinine as a prophylactic and specific for influenza," expressed the wish that the health authorities would make dosing with quinine on a large scale compulsory during an influenza epidemic.

From the above observations, therefore, we may conclude:

First: Quinine has a definite stimulating effect upon the muscles of the heart and arteries, when taken in proper therapeutic doses.

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Second: Quinine has a definite effect upon the white cells of the body—(1) an increase due to a higher per cent of lymphocytes, coming on rapidly; (2) a return to normal with polys remaining about the same in both periods; (3) a leucocytosis with increase in polys; (4) a leucopenia if continued over several (three to four) weeks' time, or in too large doses; (5) a slow return to normal after quinine is discontinued (two to three weeks), which return to normal is hastened by use of small doses of quinine.

Third: Influenza produces a definite and rapid leucopenia, especially in severe forms, including broncho-pneumonia from influenza.

Fourth: Extensive use of quinine particularly as a prophylactic in "flu" has given splendid results.

Fifth: It has been noted people taking quinine for malaria, when subjected to an epidemic of influenza, seldom ever take the disease.

If, then, you compare the leucopenia caused by influenza *vs.* the leucocytosis caused by quinine, both in the early period of infection or use, the answer appears reasonable that the increase of white cells caused by quinine has a great deal to do with the clinical results shown by use of quinine as a prophylactic *vs.* influenza.

If the above suggestions may have any good effect during the next epidemic of influenza, I shall feel that my time and efforts have been well spent.

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THE ULTIMATE PROGNOSIS IN ECLAMPSIA.

M. P. RUCKER, M.D.,
and
ENNION S. WILLIAMS, M.D.,
Richmond, Virginia.

When the immediate death rate from eclampsia ranged from 25 to 40 per cent the ultimate prognosis was relatively unimportant. Now when many clinics have a maternal mortality of 5 per cent or less, more and more attention is being paid to the prognosis for the patient who recovers. Attention is directed particularly to the behavior of these patients at subsequent pregnancies and to their likelihood of developing cardio-renal-vascular disease. These reports naturally vary somewhat. In the first place, the criteria for the diagnosis of "toxemia" differ. Some consider a systolic blood pressure of 130 mm. of mercury evidence of toxemia, whereas others place this figure at 140 or 150 mm. of mercury. In the second place, the length of time the patients are followed varies. Usually it is stated that from two to twenty years have elapsed since the initial toxemia, but the cases have not been broken down into five year or ten year groups, as is the universal custom in studies on the prognosis of cancer. Nevertheless, there has been a certain agreement in these reports. For instance, Browne and Dodds, of the University

of London, using 130 mm. of mercury as a basis for the diagnosis of "hypertension," found that 6.5 per cent of their eclamptics died immediately, 26 per cent remained well, and 60.8 per cent had hypertension. Lewis, in a study at the Nashville General Hospital, found that, of the eclamptics who survived, 10 per cent had a recurrence of eclampsia and nearly 40 per cent subsequent pre-eclampsia. Forty per cent had normal subsequent pregnancies and 10 per cent a chronic vascular renal disease as evidenced by a systolic blood pressure of 140 mm. of mercury. T. J. Williams, in an address at the recent spring postgraduate clinics of the Medical College of Virginia, said that approximately 50 per cent of the toxemia patients, convulsive and non-convulsive, at the University of Virginia, had subsequent hypertensive or toxic pregnancies. According to these three recent studies the ultimate prognosis depends upon a number of factors. In general, the older the patient, the greater her parity, the greater the number of fits, the higher the blood pressure during pregnancy and the higher her blood pressure upon discharge, the more likely she is to have permanent vascular damage.

In our follow-up studies we have confined ourselves to the convulsive group because it is a more homogeneous and more sharply defined group than the combined convulsive and non-convulsive toxemias. In doing so, we do not mean to suggest that pre-eclampsia is not important or does not merit consideration. Peckham has shown that pre-eclampsia is more likely to be followed by permanent damage than is eclampsia. He attributes this to the fact that eclampsia is of a shorter duration. In pre-eclampsia there is a greater tendency to temporize and the patient is exposed to the effects of the disease for a longer time than is the case when she has convulsions. The criterion for hypertension for one of us in 1931 was a systolic pressure of 150 mm. of mercury and we have kept the same standard in the present study.

In 1931, one of us (M. P. R.) attempted to locate his surviving eclamptics. This was fairly easy for the private patients as he was still in touch with most of them. Information concerning the ones he had seen in consultation was kindly furnished by their family doctors. The clinic patients presented a greater problem. Negro patients are notoriously careless about names, and often their names are spelled entirely differently on subsequent admissions. An other group, fortunately a small one, that gave trouble in the follow-up study was the unmarried white mothers. Usually all trace of these was lost when they were discharged. The records of the out-patient department and of the Memorial and St. Philip Hospitals, as well as the vital statistics in the City Hall were searched. In this way some record of eighty out of 171 patients was found. From the nature of the follow-up, this was probably the worst half. Recurrent eclampsia occurred in 7.6 per cent. This year an attempt was made to bring the study up to date. The cases since 1931 were private patients, so our efforts were limited to writing to their doctors. Here, too, the unmarried mothers could not be traced. Another difficulty encountered was a shift in the population that occurred during the depression. A number of doctors wrote that the patient had moved and that he had lost all trace of her. Miss Estelle Marks, of the State Bureau of Vital Statistics, very kindly searched the files of the marriages and deaths and located several in this manner. It is, of course, possible that some may have died in another state.

What information we have been able to gather was charted so that each line of the chart represents a patient with her eclampsia, abortions, miscarriages, labors (toxic and otherwise), blood pressure determinations, whether normal or hypertension, and death indicated in the appropriate age columns. The cases were then broken down into a five year study, a ten year study and a more than ten year study.

There were 109 patients of whom we had some knowledge for five years after the eclamptic seizure. These patients had ninety-four subsequent term pregnancies in the five following years, of which nineteen were toxic. Seven of the nineteen toxic pregnancies were eclamptic. There were in addition four miscarriages and sixteen abortions, four of which were induced. Twenty of the patients who did not become pregnant in this period had a normal blood pressure. Fifty-eight showed no evidence of toxemia in their subsequent pregnancies, so that seventy-eight of the 109 patients, or 71 per cent, showed no evidence of permanent vascular damage. One had advanced tuberculosis and one hypertrophic vulvitis. Four patients had a systolic blood pressure of over 150 on one or more occasions, and six died. Two of these deaths were due to tuberculosis and four to hypertension.

The ten year study shows the fifty-three patients who were followed from six to ten years. In this

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group there were seventy-five subsequent term pregnancies, of which fourteen were toxic. Five of the fourteen had eclampsia. There were seven miscarriages, three of which were considered toxic and fifteen abortions, two of which were induced. Eleven of the patients who had no subsequent pregnancies were known to have normal blood pressures. Twenty-three patients showed no evidence of toxemia in their subsequent pregnancies, a total of thirty-four patients with no permanent vascular damage, or 64 per cent. Four had hypertension on one or more occasions in this period and two of this hypertensive group died.

Twenty-nine patients were followed for more than ten years. These patients had fifty-five subsequent term pregnancies, of which thirteen were toxic, including four attacks of eclampsia. There were in addition eight miscarriages, seven of which were toxic, and twenty-three abortions, five of which were induced. Four patients did not become pregnant again and remained normal, and eleven remained normal through their subsequent pregnancies, a percentage of 51.7 who were free from hypertension. Six patients were known to have hypertension and another had apoplexy at her last pregnancy in her forty-seventh year. The report that we got of her said nothing about her blood pressure. Five patients died, three of whom had hypertension.

To summarize, 71 per cent of the five year group, 64 per cent of the ten year group, and 51.7 per cent of the more than ten year group remained free from evidence of vascular-renal disease. In round numbers, 5 per cent (of the last 142 patients) died immediately, 5 per cent in the first five years, 4 per cent in the next five years, and 17 per cent after that period.

The question arises whether this is a greater number of deaths than would be expected in a similar group of the same ages who had not had eclampsia.

The expected mortality was calculated for the years of life exposed in the charts. For a basis, it was decided to use the Life Table for White Females for the years 1929-1931. This table, which is based on the 1930 census, was published in Dublin and Lotka's book, "The Length of Life."

The results are shown in the following table:

(1) Years Exposed	(2) Actual Deaths	(3) Expected Deaths	Ratio % (2) ÷ (3)	Probable Error
3198	13	14.7	90%	± 18

The causes of the thirteen actual deaths were as follows:

Toxemia	4	Tuberculosis	2
Hypertension	3	Unknown	4

It is surprising to find that there were fewer actual deaths than would be expected according to this life table. While it must be admitted that the follow-up method used may have missed some deaths, this does suggest that the mortality of women with a history of eclampsia is not unduly excessive.

CONCLUSIONS

A study of the subsequent course of patients who have had eclampsia shows that a certain percentage, 7½ per cent of our cases, will have a return of the convulsions at a subsequent pregnancy.

A larger percentage, the exact figure depending on the length of time that the patient is observed, will have hypertension whether or not there are subsequent pregnancies. Twenty-nine per cent of the five year group, 36 per cent of the ten year group and 49 per cent of the more than ten year group had hypertension.

The known mortality, however, was not greater than the expected mortality for white women of the same ages.

THE DIAGNOSIS AND TREATMENT OF STOMACH TROUBLE.*

J. SHELTON HORSLEY, M.D.,
Richmond, Virginia.

Stomach trouble, backache and headache are human miseries that may be trivial or may be symptoms of grave conditions. It is important not to neglect even the apparently trivial cases of indigestion on the one hand, nor to make a "mountain out of a mole hill" on the other. Here comes in the significance of good judgment on the part of the

From the Surgical Department of St. Elizabeth's Hospital, Richmond, Va.

*Read before the East Tennessee Medical Association, at LaFollette, Tenn., September 12, 1940.

practitioner who first sees these cases. Much of the teaching of Alvarez concerns the type of patients who continually revel in their gastric discomforts. After a thorough examination has been made and the real cause of the complaints has been determined, the treatment often requires no medication, but a regulation of the patient's life by the psychological recommendations of the practitioner.

As is well known, the stomach is frequently the "goat" of other affections and in indigestion the stomach itself is often not primarily at fault, but merely affords expression for other diseases. Thus, stomach trouble of some kind may arise from a tumor of the brain, or from an infection of the foot. Almost all acute infectious diseases give as an early symptom anorexia, nausea and vomiting. Any kind of toxic disease or poisoning may produce anorexia or nausea. Psychic or emotional disturbances and improper diet are among the common causes of stomach trouble. On the other hand, organic affections of the stomach, such as ulcer or cancer, may give rise to symptoms of indigestion, and cancer in certain portions of the stomach may be far advanced before it shows any gastric symptoms whatever.

In such a condition of affairs, the treatment naturally is varied and this field is rich for the cultists and for empirical remedies. Occasionally remedies will seem to be effective when there is no definite therapeutic explanation. Everyone has heard of the old woman remedy of damson preserves for hiccoughs. We frequently use it for hiccoughs, not neglecting, however, other more logical remedies. Occasionally it seems to be successful. Whether it is because the disease is about to get well of itself, or whether there is a psychological or therapeutic value to it, I do not know, but at any rate it does no harm and when the patient or his relatives have their minds firmly fixed on damson preserves as a remedy for hiccoughs, far be it from me to withhold such treatment.

Numerous diets are used which have no logical basis. They range from raw eggs to sauerkraut. Fletcherism, which consists in masticating foods for a long time in a definite manner, was for a while quite popular, but seems to have lost its vogue.

ANATOMY AND PHYSIOLOGY

In order to understand the rationale of stomach disorders, it might be well briefly to review the anatomy and physiology of the stomach and small intestines. The stomach is divided by Cannon for physiologic observations into the body and the pyloric end of the stomach. These are separated by a notch at the lesser curvature, the incisura angularis or re-entrant angle, and a line drawn from this point to a point opposite it on the greater curvature divides the two portions of the stomach. The part above a horizontal line drawn through the cardiac end of the esophagus is the fundus, and in the usual X-ray examination it is filled with gas. On the right of the line from the incisura angularis to the greater curvature is the pyloric portion of the stomach, which is divided by some observers into three parts and by others into two. The vestibule and the antrum have essentially the same function and such a subdivision seems to be unnecessary, so it might be said that the pyloric portion of the stomach consists of the antrum and the pyloric canal. There are three muscular layers. The pyloric canal is about $1\frac{1}{4}$ inches in length and contains thick circular muscular fibers terminating in the pyloric sphincter. It is in the pyloric canal that congenital pyloric stenosis occurs.

The external nerve supply is from the sympathetic and the parasympathetic nerves. Within the stomach are the myenteric or Auerbach's plexus between the longitudinal and circular muscular coats, and Meissner's plexus in the submucosa. The extrinsic nerves of the stomach are from the vagus and the sympathetic. The vagus carries most of the stimulating fibers, but a few of the inhibitor. The chief inhibitor fibers go through the sympathetic, though the sympathetic also carries a few of the stimulating fibers. The stomach of an experimental animal can be separated from its external nerve supply and after a few weeks of turmoil will readjust itself fairly well to functioning under its local nerve supply.

The pyloric portion of the stomach secretes an alkaline fluid, but no hydrochloric acid or pepsin. The hydrochloric acid and pepsin are secreted by the main body of the stomach, from the re-entrant angle up to and including the cardiac portion.

The great majority of gastric symptoms comes from derangement of the motor system. Peristalsis as observed roentgenologically begins about the middle of the body of the stomach and proceeds with increasing vigor toward the pylorus, while the fundus of the cardiac portion is in tonic contraction as a rubber bag.

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Alvarez and others have shown that the real initiation of gastric peristalsis begins along the lesser curvature where the tissue acts as neuromuscular tissue as in the sinus of the heart. This movement is too delicate at first to be detected by the x-rays. There is also what Alvarez calls a gradient, that is, the muscle along the lesser curvature of the cardiac end of the stomach intrinsically contracts more rapidly than that at the pyloric end. In the cardiac portion of the lesser curvature it contracts at the rate of eleven contractions per minute; muscle from the pyloric end of the stomach makes only two contraction per minute. With such delicate mechanism it can be readily seen that the motor arrangement of the stomach may easily be upset. The musculature that contracts more readily and rapidly is more sensitive to toxic influences, so that in acute infectious diseases, for instance, the musculature along the cardiac portion of the lesser curvature of the stomach is more profoundly affected than at the pyloric end, and the rate and force of contraction may be reversed. This will cause nausea and occasionally even vomiting.

Then, too, the reflexes from a distance are pronounced. Walter Hughson has shown that a marked reflex pylorospasm may be induced by injury to the peritoneum, but that section of the vagus nerve just below the diaphragm or along the lesser curvature will relieve this pylorospasm, for it breaks the arc of the reflex. This accounts for the frequent nausea and vomiting in abdominal affections in which the peritoneum is involved, as in appendicitis.

The actual secretion of the stomach, strange to say, has but little to do with most symptoms. Achlorhydria if it exists for a long time may cause fermentation in the stomach and duodenum with increased bacteria because the hydrochloric acid is bactericidal, but even then with a careful diet the symptoms are comparatively slight. Routine examination of the stomach contents, even in younger people, has shown that there is a larger percentage of individuals with low acid or even achlorhydria than has been usually supposed. When the achlorhydria is intrinsic in the stomach the treatment by giving hydrochloric acid is obvious. When, however, it is due to other things, as toxemia from cancer or a diseased gall-bladder, this treatment will not be so effective as removal of the cause would be.

VITAMINS

In recent years the vitamins have come into great prominence, and the deficiency of some of the vitamins in the diet may in itself cause indigestion. The importance of vitamin A, the B complex including B_1 commonly known as thiamin and B_2 (flavin), and nicotinic acid which tends to prevent pellagra, is recognized. Vitamin C, ascorbic acid, sometimes known as cevitamic acid, prevents scurvy with its derangements of the digestion and of the mouth. Vitamin D prevents rickets, and vitamin E, chemically related to the sterols, is associated with the maintenance of the reproduction processes. Vitamin K is essential for the proper coagulation of the blood. Vitamin P, prepared from orange peel, seems to have a beneficial effect in the management of certain forms of vascular purpura in children, though it apparently has no direct effect upon the symptoms of stomach trouble. The consideration of the diet in preventing stomach trouble or in its treatment is, of course, essential but cannot be more than mentioned here, though the necessity of providing other things than carbohydrates, fats, proteins, water and salts is increasingly obvious.

VARIOUS CAUSES

Derangement of the stomach dependent upon reflexes has been mentioned, and pylorospasm may occur from a diseased appendix or from direct stimulation through the vagus. Eye strain, headache, cerebral or spinal lesions may precipitate stomach trouble. Indigestion due to toxic conditions should be recognized and treated at the source. Not infrequently a nephritis will manifest itself first as a stomach symptom. The toxemia of pregnancy, the diseases of the liver which prevent elimination or the normal changes in amino acids and other material absorbed from the intestines may give early signs of stomach trouble. Naturally improper foods or excessive indulgence in alcohol may irritate the gastric mucosa and upset gastric peristalsis.

HUNGER PAINS OR FOOD RELIEF

Of the different forms of indigestion, probably the most characteristic is the so-called "hunger pain". This comes on usually with clock-like regularity two or three hours after a meal when the stomach is about empty. Its etiology has never been satisfactorily ascertained, though Cannon has demonstrated that the direct cause of hunger pain is ex-

cessive gastric contraction. It is known, however, that it usually occurs when the value of the hydrochloric acid in the stomach is high, after the food has been emptied, and the normal secretion of hydrochloric acid remains. It may be due to the action of the acid upon the tissues of the peptic ulcer which have been already sensitized by the inflammation, though a wound in the stomach which exposes a raw surface does not usually produce these hunger pains. At any rate, efforts which tend to lower the acidity of the gastric juice, such as giving food, alkalies or a Sippy diet, usually relieve this discomfort.

Hunger pains, however, are not always due to peptic ulcer. Thus, Dr. W. H. Higgins reviewed 162 consecutive abdominal operations at St. Elizabeth's Hospital, Richmond, Virginia, in which there seemed to be some symptoms of disturbed digestion. Of these, there were 33 cases of chronic cholecystitis of which 5, or 15.4 per cent, gave a definite history of food relief. Of 47 cases of chronic appendicitis, 7, or 17.5 per cent, showed food relief. In 34 cases of combined chronic cholecystitis and chronic appendicitis, 3, or 8.6 per cent, gave a history of food relief. In 46 cases of peptic ulcer, 21, or 45.7 per cent, gave a history of food relief. "The interesting feature of this summary is the relative frequency of hunger pains in gall-bladder, appendiceal and duodenal infections. Relief of pain by ingestion of food has been generally recognized as a cardinal symptom of duodenal ulcer, and has served as one of the most important differential points in the diagnosis of this condition. It is rather remarkable that slightly less than one-half of the ulcer cases in our series gave this history. We may assume from this low percentage that a duodenal lesion alone is not the sole provocative factor, and it becomes more apparent when we find the same symptoms in from 8 to 17 per cent of our chronic gall-bladder and appendiceal cases."

DIAGNOSIS AND TREATMENT

The diagnosis and treatment of stomach trouble, then, demand a broad medical vision and include not only the observations that an intelligent physician would make, but an appreciation of the few instances in which the patient should be referred to a specialist. The great majority of cases of stomach trouble can be diagnosed and treated successfully by the general practitioner. The important thing in these cases is to recognize and treat the patient as well as the disease. Cannon and other physiologists have pointed out experimentally what has been obvious to the careful clinical observer, that the relation of the nerves and the endocrines to the process of digestion is very marked. A patient who is under a nervous strain, who has some secret sorrow, who is discontented and worried, frequently has indigestion. The environment and the mental condition of the patient must always be considered. The profound effect of the cerebrum in initiating impulses is well known. William Beaumont, the father of physiology of the stomach, discovered and described accurately very many fundamentals which are now recognized. Among them is the fact that food placed in the stomach almost immediately excited the secretion of gastric juice, but one important thing that he might have found, but did not, was the later discovery by Pavlov and others of the so-called appetite gastric juice; that is, that food placed in the mouth before it reaches the stomach, or even the suggestion of food or the odor of food, will bring gastric juice when there is no physical contact with the mucosa of the stomach. The stimulation of the secretion of gastric juice by food is usually accompanied by the stimulation of gastric peristalsis.

The treatment of the patient and the regulation of the diet go hand-in-hand. Not infrequently the regulation of the diet is too rigid. Food unpalatable and distasteful is often wrong. There are, of course, restrictions that are necessary in the quantity or quality of intake, and in these days with accurately trained dietitians the effective diet for certain diseases has been well worked out. It is obvious that with certain abnormal appetites it may occasionally be necessary to give a restricted and unacceptable diet.

The excessive use of alcohol is, of course, deleterious, but, particularly in people of middle age or past middle age, alcohol given in proper amounts and in palatable drinks may be distinctly beneficial. In the elderly, for instance, the administration of some form of liquor as an eggnog, or something that carries nutrition, may be advantageous.

Another prominent cause of stomach trouble is allergy. Despite the jibes that have been cast at allergy, a real basis for its manifestations undoubtedly exists. Many cases of stomach trouble are

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precipitated or actually caused by some allergic condition. The fact that milk or eggs are allergic to some individuals has been proved. Other articles of diet may disagree with an individual without any obvious physiologic or biochemical reason. The old phrase that "what is one man's meat may be another man's poison" is one of the allergic principles.

LESIONS OF THE STOMACH

When, however, we come to an important minority of cases in which stomach trouble is caused by a lesion of the stomach or duodenum, the picture changes. The two outstanding intrinsic lesions that cause stomach trouble are peptic ulcer and cancer. Again referring back to the physiology of the stomach, its location has much to do with the symptoms. Only about half of the peptic ulcers give distinct symptoms of hunger pain or food relief. Peptic ulcer in the stomach undoubtedly may cause cancer. Just how many cases of cancer of the stomach are caused by peptic ulcer it is difficult to say, but everyone acknowledges that there is a certain percentage of gastric peptic ulcers that turn into cancer. I have seen several cases, and I believe a correct estimate would be probably about 15 per cent of cases of gastric cancer that are preceded by peptic ulcer. Competent roentgenologists say that practically every lesion along the greater curvature of the stomach that can be demonstrated roentgenologically is malignant, while the majority of lesions on the lesser curvature and along the posterior wall of the stomach are benign.

Peptic ulcer of the duodenum is far more frequent than peptic ulcer of the stomach, and peptic ulcer in either the stomach or the duodenum is more common in men than in women. Peptic ulcer in the duodenum is usually found in the younger males though no age is actually exempt. Strain, stress and worry have much to do with its etiology. Cushing has shown that after operations upon the brain in which the basal structures are involved peptic ulcer frequently occurs. Stimulation of the vagus nerves tends to produce hyperemia of the stomach, heightened tone of its muscles and increased secretion of hydrochloric acid. Yet there are some instances of peptic ulcer that cannot be ascribed to nervous influences. Rosenow contends that the streptococcus viridans is at fault in many of these cases, and peptic ulcer has been reported in infants in whom worry about the stock market or disappointments in love cannot be a factor. In such instances, milk contaminated by infected udders of cows may be the cause.

Peptic ulcer of the duodenum should always be treated medically unless there is some complication, such as hemorrhage, perforation or obstruction. Hemorrhage in a peptic ulcer in a patient past 45 years of age usually calls for operation, because it is more than likely to be repeated and with the thickening of the arteries it is more difficult to control. Small hemorrhages, though, in the younger may be safely entrusted to proper medical care.

Peptic ulcer of the stomach, however, is a different problem, because peptic ulcer of the duodenum very rarely becomes malignant, though there are some cases on record. There is no cure for cancer of the stomach except a surgical operation. A prepyloric ulcer in the stomach is more likely to be malignant than one farther up on the lesser curvature. When peptic ulcer of the stomach does not yield to careful medical treatment after a few weeks, in my judgment operation should be advised, preferably excision of the ulcer by a partial gastrectomy which will permit the emptying of the stomach contents into the duodenum instead of into the jejunum.

TREATMENT OF PEPTIC ULCER

As for medical treatment, the diet for a peptic ulcer is quite well known. The use of bicarbonate of soda, except in very occasional instances, should be avoided. The frequent taking of bicarbonate of soda often causes an alkalosis, it actually increases the secretion of the stomach and eventually may produce a gastritis. The better treatment is by the use of foods, with the Sippy diet as the basis, and modified to suit the case. It is important to see that the food is soft and smooth. It has been shown experimentally that rough food in artificially created ulcers in a dog prolongs the healing, so such things as lettuce, celery, corn and cabbage should be avoided. In the administration of alkalies, however, the best medicine for continuous use is usually some form of carbonate of magnesia, and particularly tablets composed of calcium carbonate, magnesium carbonate and bismuth subcarbonate. These may be taken almost indefinitely without injury to the gastric mucosa and with but little danger of alkalosis. Preparations or derivatives of belladonna are often helpful.

When a peptic ulcer develops within the grasp of the pyloric sphincter, or has penetrated into the

pancreas, it is usually but little affected by medical treatment and demands a partial gastrectomy.

The physician who treats a peptic ulcer of the stomach indefinitely by medical means assumes a very grave responsibility. Even though relief may be satisfactory within a few weeks, there may be a recurrence. Here the examination by a competent roentgenologist is highly important. Probably one of the most dangerous influences in cancer of the stomach is friendship, and this may include not only the lay friends of the patient but the doctor friends who do not wish to face disagreeable facts. *Practically all early cases of cancer of the stomach are relieved by medical treatment at first; so relief of symptoms by medical treatment is not a therapeutic test in early cancer.*

Cancer of the stomach gives no typical symptoms. There may be hunger pains or only a "slight indigestion". Hydrochloric acid in the gastric juice is usually low or absent, but may be normal or even high. The important point in every case of stomach trouble is to be suspicious. In any complaint of indigestion that cannot be satisfactorily explained or accounted for there should be a gastric analysis followed by a competent roentgenologic examination both by plates and the flouroscope. If the lesion of the stomach is reasonably doubtful as to malignancy, it is safer to operate than to wait. If the roentgenologic examination shows cancer, certainly there can be no point in waiting. Whether an early lesion may be a beginning malignant ulcer, or whether it may be a peptic ulcer turning into cancer, makes no difference clinically. The lesions are equally dangerous. And the only treatment for gastric cancer is operation.

CONCLUSION

The fact that there were 27,102 deaths from cancer of the stomach in the Registration Area of the United States in 1938, is a thing that should excite our profound interest and makes it incumbent upon practitioners that the cause of stomach trouble shall be well established before dismissing the case as one in which there is no organic lesion. Those who have had much experience in gastric surgery have seen cases that have been treated for nervous indigestion for years before cancer was suspected, and when the malignancy was found it was frequently too late. It is only by intelligently "watching our ramparts" of stomach trouble that we shall be able to detect the small percentage of serious organic lesions of the stomach that demand surgical treatment.

A RAPID BEDSIDE MICRO-PROTHROMBIN TEST— A Preliminary Report.

CHARLES STANLEY WHITE, M.D., F.A.C.S.,
DANIEL J. ABRAMSON, M.D.,
JACOB J. WEINSTEIN, M.D.,
and
Technical Assistant—
MARY T. SPROUL, M.A., M.T.,
Gallinger Municipal Hospital,
Washington, D. C.

Increasing interest is being shown in the relationship of the prothrombin in the blood to hemorrhagic disease of the newborn and various conditions which decrease bile salt production or prevent the flow of bile to the intestines. It is now known that the hemorrhagic diathesis in these conditions is due to an abdeficiency is extreme. Numerous methods have been developed for determining the prothrombin level. In normal lowering of the blood prothrombin. The ordinary tests for bleeding and clotting time seem to reveal this abnormality only when the prothrombin bedside procedure for the determination of prothrombin, designed to make it more acceptable for use in this paper we wish to describe briefly a simple, rapid the average hospital.

***M/40 calcium chloride is prepared by dissolving 1.11 grams anhydrous calcium chloride, C.P., in 400 c.c. of distilled water.**

****Thromboplastin suspension is prepared from the brain of a freshly killed rabbit as described by Quick.[5] This is kept in the ice box when not in use.**

METHOD

Ten c.mm. of M/40 calcium chloride* and 10 c.mm. of freshly prepared thromboplastin** are measured out separately with microhemopipettes[1] and placed side by side, without mixing, in the well of a clean hanging drop slide. If only one microhemopipette is available, it should be rinsed with normal saline after each use. The site selected for bleeding is cleansed with alcohol and wiped dry. After making a satisfactory puncture with a lancet and discarding the first drop of blood, blood is then drawn to the 10 c.mm. mark in the pipette. This is rapidly added to the other reagents and the three are mixed thoroughly for several seconds with a fine glass rod. The slide is then tilted slowly from side to side until the mixture begins to gel. Then by gently passing the glass rod through the gelatinous mass, the end point is corroborated. The time of clotting is determined accurately with a stop watch, which is started when the reagents are mixed and stopped at the first sign of clot formation. The end point is definite.

Thromboplastin, stored in the ice box, is brought to room temperature just prior to use.

The heel, preferably the edge of the plantar surface in premature and full term infants, and the finger tips in older children and adults are suitable sites for bleeding.

FINDINGS AND DISCUSSION

This technique is based on Quick and associates'[2] original test, depending upon recalcification and the addition of an excess of thromboplastin. Quick[3] also described a rough test in which the coagulation time is determined by mixing one drop of whole blood with one drop of thromboplastin. Kato's modification[4] of Quick's original test makes use of whole oxalated capillary blood instead of oxalated plasma. Both Kato's and our test eliminate centrifugation, venipuncture and the difficulties associated with venipuncture in infants. In our experience with Kato's method, however, the end point was not always definite and at times there were variations in results when the test was performed immediately and then again after standing for one-half hour. In order to eliminate the above difficulties, we have developed the bedside procedure previously described. Since our test, requiring only one drop of blood, is performed immediately, there is no deterioration of prothrombin and no need for oxalating the blood.

Our test, compared with Quick's and Kato's methods, on seventy-five normal cases, shows a satisfac-

CHART I.

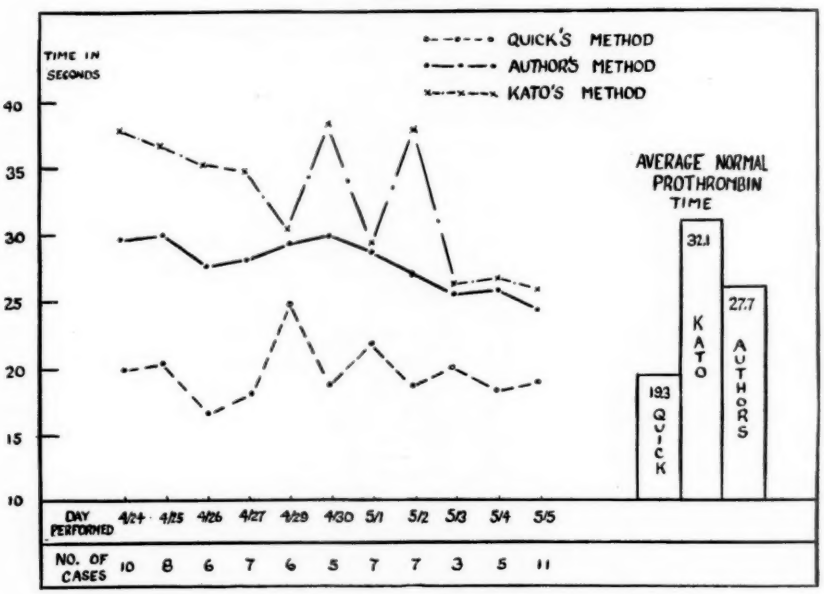

Chart I.—Prothrombin determinations of seventy-five normal individuals by Quick, Kato and author's methods.

tory correlation of results. This can be seen by referring to Chart I. The average normal prothrombin time was 27.7 seconds. A comparison of the aforementioned methods was made on newborn babies, one to four days old, and on cases with obstructive jaundice. The results obtained indicate that our test can be used in cases where prolonged prothrombin times occur.

SUMMARY

1. A rapid bedside method for the determination of prothrombin, requiring only one drop of blood, is presented.

2. Since the test is performed immediately after drawing the blood, there is no deterioration of prothrombin.

3. The average prothrombin time on seventy-five normal cases was 27.7 seconds.

4. It is a procedure adaptable for use in the average hospital and particularly suited for use on newborn babies.

5. The test compared favorably with the methods of both Quick and Kato.

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1801 Eye Street.

ROENTGEN THERAPY OF INFLAMMATORY CONDITIONS.

WILLIAM H. WHITMORE, M.D.,
Norfolk, Virginia.

The therapy of inflammatory conditions is a wide field, in which the roentgenologist may obtain results which are most gratifying to both the patient and the physician. This is especially true in the acute infections, where roentgen therapy often causes a dramatic relief of pain and a rapid change from a virulent, spreading inflammation to a minor, localized suppuration. Unfortunately, however, the roentgenologist sees a relatively small percentage of the acute inflammations, and very few of them in the early stages, when roentgen therapy is most effective. This is, in part, due to the general belief that most acute inflammations are of minor importance, and self-limited or easily handled by poulticing or by simple incision. Often it is only when these minor infections fail to respond to home treatment that a physician is consulted, and usually these cases are referred to the roentgenologist only when ordinary methods of treatment have failed, or when, by reason of the location of the process or a virulent course, the prognosis is poor with surgical or medical treatment. This situation is gradually changing as physicians, including roentgenologists, are convinced by their own experiences of the great value of the roentgen ray in the therapy of infections and inflammations.

In the chronic inflammatory lesions the results of roentgen therapy are not so spectacular as in the acute processes; many of these cases have been treated with a variety of local applications, internal medications, vaccines, antigens and serums, before coming to the roentgenologist; quite frequently, the use of one or more of these agents in conjunction with properly administered roentgen therapy will result in the rapid relief of a chronic, disabling process; in a few chronic infections the roentgen rays have almost a specific action.

The first report of the successful treatment of acute inflammations with the roentgen ray appears to have been by Coyle[13] in 1906, although before this Musser and Edsall[65] in 1905 had suggested the use of X-rays in unresolved pneumonias, and in 1906 Edsall and Pemberton[26] reported the rapid resolution of unresolved pneumonia following roentgen therapy. These reports attracted little attention, apparently, but in 1916 Dunham[24] reported sixty-seven cases of carbuncle treated by roentgen rays. This was followed by the reports of Ross[75] in 1917, Richards[74] in 1922, Lewis[58] in 1923, and Hodges[41] in 1924. Dunham,[25] in an editorial in 1927, stated that "The X-ray is almost universally beneficial in the treatment of infection" and that many roentgenologists were over-

looking the treatment of minor but sometimes virulent infections.

The action of roentgen rays in inflammations is generally considered to be due to the destructive effect of the rays on the leucocytes. Warthin[84] found evidence of the beginning disintegration of lymphocytes fifteen minutes after X-ray treatment. Thorsness[83] demonstrated the effect of the antibodies released by the disintegration of leucocytes; he produced two or more experimental abscesses in the same animal, treated one abscess with X-rays, and found that the untreated abscess showed changes similar to those of the treated abscess, which he interpreted as due to circulating hormones liberated at the irradiated area. Soto, Brunschwig and Schlutz[82] have recently published a study of the effects of radiation in acute pyogenic infections.

The treatment of acne in its various forms is given considerable space in all the books on skin diseases, as well as in some of those dealing with roentgen therapy. The treatment of acne cannot be according to any fixed routine, but must be planned individually for each case: the girl with acne rosacea will require a different regime from that of the man with a long-standing, chronic, acne vulgaris. Both will require small doses of roentgen rays at intervals of four to seven days, but the acne rosacea may be treated with low voltage unfiltered rays, while the acne vulgaris will require higher voltage and filtration graded in accordance with the depth of the involvement and the amount of scarring present. In all cases, regardless of the filtration and dosage of the rays, care must be observed; small doses of roentgen rays may be repeated many times without producing any visible skin reaction, but, if the skin tolerance is exceeded, late changes, such as skin atrophy and telangiectasia, will occur, and the final result may be worse than the disease treated. Sherman[78] has reported on his twenty-seven years of experience in treating acne with roentgen rays, and is of the opinion that good results are obtained when roentgen therapy is combined with the proper associated treatment.

Actinomycosis may cause an acute, and fatal, infection, but generally runs a sub-acute or chronic course. Roentgen therapy, combined with surgery and the administration of iodides, is the best treatment now available. Desjardins[16] is of the opinion that the chief factor in the cure of proven cases has been irradiation. Treatment may be given with low or intermediate voltages in the superficial lesions, but in many cases high voltage with moderate or heavy filtration may be required to deliver an adequate dose to the involved tissues. Treatment may be given daily, or at intervals of several days; the total dose will vary with the quality of the ray, but should be within the skin tolerance. Archer[2] has reported good results in cervico-facial lesions, with surgery, iodides, and irradiation. Smith,[79] in 1934, reviewed the literature and compiled the results of roentgen therapy in actinomycosis. Of 129 cervico-facial cases, 107 were healed, twelve improved, and ten died; of forty-five abdominal cases, seventeen were healed, six improved, and twenty-two died; of twenty-one thoracic cases, two were healed, two improved, and seventeen died.

Adenitis involving the cervical, axillary, or inguinal glands, and some forms of mediastinal adenopathy, will usually respond to moderate doses of X-rays. Here the voltage and filtration must be varied with the depth and size of the involved glands; generally, with 140 KV and 0.25 mm. copper and 1.0 mm. aluminum filters, or 200 KV and 0.5 mm. copper and 1.0 mm. aluminum filters, 150 to 300 r may be given and repeated two or three times at intervals of seven to ten days. In some cases a single treatment will cause rapid regression of the enlargement, and generally only two or three treatments are needed. Pfahler and Kapo[69] reported 333 cases of cervical adenitis treated with roentgen rays; of these, 133 were diagnosed as tubercular. They are of the opinion that chronic enlargements of the cervical glands are perhaps the result of repeated focal infections with possible secondary invasion by the tubercle bacillus. Their cases treated during the last five years of the period covered were all greatly improved or cured.

Arthritis and para-arthritis, both the acute and chronic types, may be greatly benefited by irradiation combined with other forms of treatment; co-operation of and with the internist is a requisite for good results, especially in the chronic cases. Langer[54] has had good results in arthritis by giving roentgen ray treatments over the vegetative nerve centers and over the involved joints, the roentgen therapy being combined with other measures; 75 per cent of his cases showed marked improvement, and 25 per cent slight temporary improvement. There was increased pain after irradiation, lasting about forty-eight hours, and in some cases up to two weeks. He notes that X-ray treatment over the involved joint is the best

treatment for gonococcus infection. Guillamet[36] has reported rapid relief of pain, and prompt improvement in gonococcic arthritis treated with moderate doses of roentgen rays. DeLorimer[15] found that acute para-arthritis cases were completely relieved by irradiation of the involved area, and that calcareous deposits were absorbed.

Various acute and chronic inflammations of the lungs and bronchi have been treated by irradiation, with some degree of success. Musser and Edsall[65] in 1905 first suggested the use of X-rays in unresolved pneumonia, and in 1906 Edsall and Pemberton[26] reported three cases of delayed resolution of pneumonia, in which treatment with X-rays was followed by prompt resolution. This method of treatment did not gain popularity, as there are no other records of its use until 1916 when Quimby and Quimby[72] reported successful treatment of twelve cases of unresolved pneumonia with the roentgen rays. Krost,[52] in 1925, and Merritt and McPeak,[64] in 1930, reported successful roentgen therapy of unresolved pneumonia. The development of serums for the treatment of pneumonias has overshadowed the use of roentgen rays for therapy in this disease; also, the lack of mobile therapy units and the objection to moving pneumonia cases for treatments has prevented any widespread use of the rays, but there is no doubt that repeated irradiations, of 100 r or more daily, are beneficial in pneumonia. Desjardins[19] has surveyed the literature and reported his own observations on the effects of irradiation on pulmonary tissues. Recently, McIntire and Smith[63] have used roentgen therapy in lobar pneumonia, with good results. Powell[71] reports on the use of roentgen therapy in 104 cases of lobar pneumonia, with a mortality of 5 per cent, and in certain types of pneumococcus infection his results have been better than with serum therapy. Powell treated the involved lung area with a single dose of 250 to 350 r, with 135 KV and 3 mm. Al. filter, repeated in thirty-six to forty-eight hours over an opposing field if the temperature had not returned to normal; when indicated, smaller doses were given at forty-eight hour intervals.

Whooping cough, with or without complicating bronchopneumonia, will be benefited by roentgen therapy given over the entire lung fields or over the root zones, alternating anterior and posterior fields and repeating the treatments at intervals of one to three days; 100 r or less is given at each treatment, and the total dose to one case is not more than three-quarters of an erythema dose. Bowditch and Leonard[6] in 1923 reported on the use of roentgen rays in pertussis, and their report was followed by a series of articles, [7, 8, 28, 53, 81,] with statistics of hundreds of cases.

Bronchial asthma is considered an allergic condition rather than an inflammation, but an *inflammatory change in the ganglia* of the vegetative nervous system is considered a possible cause or factor in this disease. Gerber,[33, 34] Ramirez and Cole,[73] McEachern,[62] and others have been successful in treating bronchial asthma by irradiating the entire lung fields, the root zones, or the dorsal paravertebral areas. I have found irradiation of the vegetative nerve centers effective in some cases. Using 200 KV with 0.5 mm. Cu. filter with 8 x 10 cm. or 10 x 15 cm. fields, and 150 r to not more than two portals at one treatment; other fields are treated at three day intervals until each field has been treated twice; this course may be repeated after an interval of several weeks. Too large a dose or too large an area treated may cause a severe reaction with exacerbation of symptoms.

Carbuncles and furuncles respond better to roentgen therapy than to any other method of treatment, and there is no other form of therapy that is as satisfactory to the patient, as there is no pain in the application and the pain of the inflammation is quickly relieved. Since Coyle[13] in 1906 published his observations on the effect of the X-rays on carbuncles, Dunham,[24] Ross,[75] Richards,[74] Hodges,[41] Light and Sosman,[59] Desjardins,[17] and others have reported roentgen therapy of such lesions with results far superior to any other therapeutic method. Firor,[30] in 1935, reviewed the literature and added his own cases of carbuncle, agreeing with Dunham[24] that "Nothing in all roentgen therapy gives such satisfactory results". Light and Sosman[59] considered roentgen rays a most valuable addition to the therapy of carbuncles. They found that large carbuncles did not respond as well as small ones, and that diabetes had no apparent effect on the result of X-ray therapy. The unsatisfactory state of the treatment of carbuncles without roentgen therapy is reflected in the article of Christopher[11] in 1928, listing some thirty methods of treating carbuncle. In May, 1934, I[35] reported on nineteen carbuncles and 151 furuncles treated with X-rays in one hospital in four and a half years; in the following five months I added six carbuncles and eighteen furuncles to the series in

that hospital. I classed any case in which the pain was not completely relieved or markedly alleviated as a failure. In the twenty-five carbuncles there was one failure—a case that was operated on fifteen days after the first and ten days after the second X-ray treatment. In the light of more experience I consider that this case received inadequate roentgen therapy. Of 169 furuncles there were four failures, these cases requiring surgery for the relief of pain. The only surgery required in any of the successful cases was—in less than one-third—a small incision; the majority of the carbuncles and furuncles opened spontaneously and drained without surgery. At the first treatment I have given from one-half to one erythema dose of roentgen rays, the amount varying inversely with the size of the area treated; additional treatments, with smaller doses, have been given as indicated, but in most furuncles and some carbuncles one treatment was sufficient. In some cases warm compresses, wet with boric acid solution, were used; in others, there was no treatment after irradiation except a protective dressing. I have used from 76 KV with no filter to 200 KV with 0.5 mm. Cu. and 1.0 mm. Al. filters, the increased voltage and filtration used for cases with deep infiltration; in the majority of the cases, 100 KV with 1.0 mm. Al. filter was used.

Osgood[67] noted undesirable reactions in acute inflammations treated with large doses of roentgen rays, and advocates small doses, 50 to 100 r, given daily or on alternate days. I have found such small doses effective in erysipelas and cellulitis, but in carbuncles and furuncles the larger doses are more effective and produce more consistently good results. Firor[30] has used 300 to 415 r on early carbuncle cases, followed in a day or two with 100 to 150 r, if indicated, but lately he has used 200 to 250 r as the initial dose with equally good results. No hard and fast rule as to voltage, filtration and dosage should be followed; the quality and the quantity of the rays should be varied to suit the individual case, according to the judgment of the roentgenologist.

Erysipelas, cellulitis, Ludwig's angina, acute mastitis with or without abscess, post-operative and post-traumatic infections,[45] will be improved and in many cases cured by adequate and timely roentgen therapy. Relatively small doses will be effective in these conditions, and, except for Ludwig's angina, low voltage with little or no filtration provides the proper quality of rays.

In the past, in both the war wounds and those of civil life, gas gangrene, or B. Welchii infection, has reaped a heavy toll of lives and limbs; Kelly[47] in 1933 reported that with roentgen therapy as an adjunct to other treatments, such as serum and drainage, five out of nine cases treated recovered. Faus[29] added more cases, and Kelly and his associates[49, 50] continued their work with a reduction of mortality and a decrease in the amputations in gas gangrene cases. In 1938 they[50] reported a summary of cases treated with X-rays—123 cases with only ten deaths and thirty-three amputations. In seventy-two cases involving extremities, in which amputation was not done, there were only three deaths, a remarkable figure when compared with the usual mortality in this disease. Kelly emphasizes the need for early and repeated treatments, best given with a mobile bed-side therapy unit. Small doses given daily or twice daily, in his opinion, are more effective than larger doses at longer intervals. Kelly[51] has used X-ray treatments as a prophylaxis against gas gangrene and osteomyelitis in wounds and compound fractures, and for the therapy of acute peritonitis.

Fistulas following operation for pilonidal cysts, after suprapubic drainage, or following the drainage of any infected area, may be healed by roentgen therapy when the persistent fistula is due to granulation tissue and not to a retained portion of a cyst or a foreign body. High voltage with moderate filtration, 200 KV with 0.5 mm. Cu. and 1.0 mm. Al. seems more effective than lower voltages; 200 r three times weekly to a total dose of 1200 to 1600 r may be required.

Herpes simplex is a minor inflammatory process, but often a very troublesome one; irradiation is an effective method of treatment.[37] In herpes zoster, roentgen therapy to the involved skin area will give relief in some cases, but treatment directed to the root ganglia of the affected segments may be more effective in shortening the course of the disease. When irradiation is given to the ganglia there may be increased pain after the first one or two treatments.

In acute or chronic otitis media and mastoiditis, roentgen therapy offers a non-operative treatment that will result in the cure of a high percentage of cases. Beattie[3] in 1921 reported the cure of fourteen cases of subacute and chronic otitis media in adults; Cherniak and Gorodetsky[10] found that five cases of mastoiditis, operated on after roentgen therapy, showed a definite limitation of the inflammatory proc-

ess. Granger[35] treated mastoiditis in infants, when there was no sign of bone destruction present, with fractional doses of roentgen rays. Schillinger[77] reported that 85 per cent of thirty-eight cases of acute mastoiditis without bone destruction showed improvement in clinical condition and signs following radiographic examinations or a small therapy dose, one-fourth S.E.D., of X-rays. Ross[76] treated forty-one cases of mastoiditis and concludes that X-ray therapy is applicable in almost all phases of mastoiditis, and that the results are satisfactory to the patient and the roentgenologist. Lucinian[60] analyzed fifty consecutive cases of otitis media and mastoiditis treated by roentgen rays; there was a consistent relief of pain, a gradual drop in fever, initial increase of discharge followed by a gradual decrease, a rapid decrease of swelling and redness of the tympanic membrane, with healing in two to three weeks; hearing improved within forty-eight hours after treatment, and necessary mastoid surgery was reduced. Crain[12] recommends X-ray treatment of all cases of mastoiditis in infants, not only for the effect on the mastoids, but also for the effect on the lymphoid tissues in the nasopharynx which block the Eustachian tubes. Dowdy, Heatly and Pierce[23] attempt to evaluate roentgen therapy in acute otitis media, and are of the opinion that roentgen therapy shortens the average course of the disease, lessens complications, and aids in the treatment of complications.

Acute parotitis will respond to roentgen therapy as an acute infection in any other part of the body. It must be remembered, however, that with the swelling there is considerable depth to the area of inflammation and infection, and for that reason high voltage rays with moderate filtration will probably be more effective than less penetrating rays. Dorrance[22] has reported the successful treatment of chronic parotitis with radium, after having had good results in the treatment of acute post-operative parotitis. Radium offers only one advantage over X-rays for this purpose—its portability. With properly filtered X-rays a better distribution is obtained, and a more adequate dose may be delivered to all parts of the infected area with less effect on the skin than with radium.

Chronic pharyngitis, in children or adults, with lymphoid hyperplasia associated, may be considerably improved or completely relieved by roentgen ray treatment. The rays should be directed to the nasopharynx, and, to avoid any marked effect on the salivary glands, the naso-frontal and submental areas should be used as portals in addition to the lateral fields. Using 200 KV with 0.5 mm. Cu. and 1.0 mm. Al. filters, 100 to 125 r may be given to each of two portals, repeating at two to three day intervals and alternating portals, up to a total dose of 800 to 1200 r in two weeks.

Tubercular laryngitis is not considered amenable to roentgen therapy, but irradiation may be beneficial or palliative in certain selected cases. Birkett[4, 5] has reported the use of X-rays in treating a case of lupus vulgaris of the oropharynx.

Infections of the nasal accessory sinuses may be considerably improved by roentgen therapy, and in many cases the symptoms may be completely relieved. These cases may not be classed as cured, but they may be considered as arrested or quiescent with the relief of the symptoms of chronic inflammation. Osmond[68] advocates roentgen therapy in the treatment of acute infections of the antrum and frontal sinuses; Smith and Nickel[80] had good results in subacute and chronic sinusitis; Hodges,[43] and Hodges and Snead[44] report very good results in selected cases of sinusitis. Eley[27] has obtained improvement in about 75 per cent of his cases of chronic sinusitis, and finds roentgen therapy most effective in the hyperplastic type of chronic sinusitis.

The tineas and all of the fungus infections are particularly amenable to roentgen therapy, and therein lies a danger. As many of these infections are chronic and recurrent, a patient once relieved by X-ray treatments will seek the same treatment for a recurrence or a re-infection. In one year, 1930-1931, I treated 144 cases of "dhobie itch" or fungus infection of the feet on the Navy Hospital ship; of these cases I found that more than one-third either returned for re-infections or recurrences within a year or had had previous X-ray therapy for the same condition. Too many roentgen ray treatments in fractional doses may cause severe and permanent skin damage even though no single set of treatments have produced any visible skin reaction. One case had been treated by me in 1928 for fungus infection of the skin on both ankles; he was treated by several others at intervals in 1929 and 1930. In 1928 he received on each area five treatments of one-quarter erythema dose at intervals of one to two weeks; the record of dosage in 1929 and 1930 could not be obtained, but the patient gave no history of any definite skin reaction. In 1931 he returned to me, requesting X-ray treatments for a recurrence or re-infection; I found that he had an

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atrophy of the skin with beginning ulcerations, and, after a year of conservative treatment, the involved areas were excised and skin grafting done.

Dorne[20, 21] had fairly good results with Grenz ray therapy of superficial fungus infections, but the results with low voltage roentgen rays seems to be better than with the long wave-length rays. The treatment of the epidermophytoses and other fungus infections will vary somewhat with the site and type of the infection; on the scalp, in some cases, a single epilation dose will be given, and after the defluvium the residual infection will be treated with medicinal applications; in other parts, 10 to 25 per cent of a skin erythema dose may be given at intervals of three to seven days. In all cases the history of previous irradiation must be diligently inquired into, and treatments must not be continued long enough to approach the skin tolerance. I have found a preparation of 5 per cent thymol and 2 per cent oil of cinnamon in 95 per cent alcohol, as recommended by Myers and Thieves,[66] a very useful adjunct in the treatment of fungus infections; phenylmercuric nitrate[55] is also of value as an adjunct or alternative therapeutic agent.

Andrews[1] states that "The only physical method that is of any great value in the treatment of dermatophytoses and dermatophytids is X-ray therapy in fractional dosage. * * * X-ray treatment is palliative but not curative. It does not kill fungi. On areas invaded by fungi topical destructive means must be used."

Levy and Ross[57] have reported remarkable improvement in cases of active rheumatic heart disease with roentgen therapy, adding another inflammatory process to the many which have responded to this agent. The list of these inflammations is long, and is being increased as roentgen therapy is more widely used, but there is a danger of being over-enthusiastic as well as of being too conservative. Dunham[25] has well said "The medical profession must be made to understand the value, the limitation, and the danger of the ray, and the roentgenologist must understand the many and varied manifestations of infection."

NOTE: Wherever dosage figures have been given in r units, the figures represent r units measured in air at focal skin distance without back-scatter.

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229 West Bute Street.

VICARIOUS OR ENDOCRINE BLEEDING: A NEW THEORY CONCERNING SPONTANEOUS HEMORRHAGE.*

PHILIP JACOBSON, M.D.,
Petersburg, Virginia.

The purpose of this article is to attempt, through some illustrative cases, to connect spontaneous bleeding with the endocrine system by showing that through attacking the existing endocrine status the hemorrhage promptly ceases.

The term vicarious or endocrine bleeding seems rather vague but I am using it in order to define certain well known types of bleeding, which I believe to be due to an imbalance in the endocrine system, the final result of which is hemorrhage from various parts of the body. These hemorrhages include those from the nose and throat, so-called functional uterine bleeding, and others to be mentioned. I would further define this bleeding as compulsion bleeding in that, like menstruation, it is the inevitable result of an association of factors and conditions in the body. If these conditions occur, and I am trying to associate them with the endocrine system, hemorrhage must follow from somewhere. The most obvious of these we consider normal, menstruation, the variations of which are familiar, such as too little, too much, or too frequent bleeding. Under this category I would include also:

1. Nose bleeding.
2. Post-tonsillectomy bleeding, that is hemorrhage which occurs from seven to fourteen days after operation.
3. Melena neonatorum and menstruation in the new born. The former is a very serious condition characterized by bleeding in the gastro-intestinal tract. Areas of necrosis and ulceration are found at autopsy in this condition, but, in my opinion, are associated with the bleeding and do not explain its etiology.
4. Bleeding from the nipples and mucous membrane.
5. Polycythemia vera and the hemorrhages associated with it.
6. Idiopathic renal hemorrhage from the pelvis of the kidney and paroxysmal hemoglobinuria.
7. Hemophilia and probably others.

It is my theory that these might be due to an endocrine imbalance which forces the patient to bleed, and the only means by which I can prove this at the present time is by some illustrative cases in which I have succeeded in over-throwing the endocrine status of the time by empirical methods, using endocrines. I realize, of course, that this method is by no means conclusive since the cases are few, and I have no concrete data concerning what was changed except the result obtained.

I am excluding from this discussion the following types of bleeding, although some of them may have endocrine factors:

1. Bleeding of hypertension.
2. Bleeding associated with cardiac decompensation.
3. Renal diseases in which bleeding can occur from the gums, the stomach, or anywhere in the gastro-intestinal tract.
4. Cirrhosis of the liver.
5. Bleeding associated with blood diseases, such as the anemias and leukemias.
6. Infections, such as typhoid.
7. Petechial bleeding.
8. Avitaminosis, such as scurvy.
9. Water deficiency.
10. Purpuric bleeding.

It is possible that endocrine factors may be in operation in some of these conditions but their connection as yet is not manifest.

Among the various types of what I shall now call endocrine bleeding, nose bleeding is the most common. In the literature, it is universally recognized that its etiology is unknown and that the hemorrhage occurs from a ruptured vessel in the septum. Treatment, so far, has been directed at the bleeding point by repeated packing and cauterizations of the area which only have been followed by bleeding within a few days or weeks. I am referring, of course, to spontaneous and not to traumatic bleeding caused by nose picking, etc. It seems strange that the history in individual attacks of nose bleeding is so universally neglected. For instance, I find especially in children that they will tell you they have a headache

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first, or a fullness in the head as if it would burst and then comes the bleeding, after which they feel much better. Also, it seems strange that cold applications are used on the nose instead of warm ones. The same surgeon who will apply hot packs to an oozing surface in the pelvis will apply cold applications to the nose and explain that it is for the purpose of reducing congestion. It is elementary physiology that heat increases the coaguability of the blood and there is no reason why it should not be used on the nose as well as anywhere else. In my experience, heat to the nose is much more valuable in this condition than cold.

However, neither of these agents are directed at the cause of the bleeding. In five cases of bleeding in male children, from five to ten years of age, the hemorrhage decreased very rapidly when these children were given either gonadotropic or estrogenic hormone. These were given as Antuitrin-S and Theelin and it is significant that the bleeding did not recur for a much longer period of time than had previously elapsed between hemorrhages. The patients who were given Antuitrin-S responded in about the same manner as those given Theelin. One patient was given both at different times. He had a history of frequent nasal hemorrhage over many years. One hundred units of Antuitrin-S was given first and repeated in two days. The bleeding did not recur for six months and then upon recurrence 2,000 units of Theelin were injected and repeated in two days. This was eight months ago and there has been no recurrence.

One case of bleeding from the lip was rather remarkable. This was a white woman, age fifty-four, who had completed the menopause, but had severe headaches associated with flushes every four to six weeks. On one occasion she presented a most unusual sight. Her face and neck were so engorged with blood that she was almost cyanotic. The veins of her face stood out prominently and one on the lower lip had eroded and was bleeding profusely. It was obvious that to suture this small hole would merely produce two other bleeding points, so I applied a mucosa clamp to close the aperture. This did the work but was painful. I then, administered 10,000 units of Theelin and it was astonishing with what rapidity this engorgement subsided. Theelin was administered subsequently over several months and the whole syndrome disappeared.

Post-tonsillectomy bleeding is explained now in two ways. The first is infection, and the second, sloughing of tissue. These did not appear to me to be reasonable but it was quite a while before the opportunity presented itself to test my theory in a case of this character. Eventually one did arrive which was in a boy nineteen years of age, from whom the tonsils had been removed eight days previously and who had bled profusely ten hours before I saw him. Within an hour after the administration of 10,000 units of Theelin, the bleeding had checked about two-thirds and within two hours ceased entirely. Nothing else was done and the patient had no further trouble.

Another case of interest was one in which I believe the emotions played a part. It is generally accepted that the emotions and the endocrine system are interlocked. This was a colored female about twenty-two years of age who began voiding bloody urine about three weeks after marriage. She was in a highly nervous and excitable condition, and the nature of the bleeding was such as to exclude all the local causes of bleeding and to indicate that it came from somewhere higher up in the urinary tract. Upon administration of Theelin the blood did disappear for a while but would recur. Cystoscopic study was done and it was discovered that the hemorrhage was coming from the left kidney but no definite lesion could be found. Attention was then directed to the nervous condition of this patient which seemed to be the result of her new marital state. When this was relieved through psychiatric means the bleeding disappeared and has not recurred in six months.

The compulsive nature of this bleeding may be shown by the case of a white woman, forty-eight years of age, who, five years ago, had a radium application for severe functional uterine bleeding. The flushes of the menopausal reaction were so severe that they nearly disabled her. Administration of large amounts of Theelin reduced these until she became quite comfortable, but after about a year she discontinued the injections. A few months later I was called to see her after she had been suddenly taken ill, when she presented the appearance of a patient in hemorrhage. No external hemorrhage was present, but the appearance of tarry stools soon indicated that she was bleeding from the gastro-intestinal tract. She complained also of severe flushes but of no abdominal discomfort whatever. Her history of gastro-intestinal disturbances was completely

negative. I administered some Theelin to control the flushes and instituted other suitable measures, not thinking at the time that the bleeding could be associated with deprivation of Theelin. In due course of time, roentgen study of the stomach revealed a small peptic ulcer near the pylorus which was evidently of the silent variety. With continued administration of Theelin to control the flushes, the bleeding did not recur, but again she stopped coming for the injections and the bleeding did recur, although not so profusely. I feel that in this case the endocrine status of this patient would compel her to bleed from somewhere if it were left alone and the only avenue open to her was the stomach.

Abnormalities of menstruation are known to be due to endocrine factors and in many cases can be corrected by the use of the endocrine products we now have, but variations are so great and our knowledge so inexact that use of such endocrines is still in the empirical stage. Not that much is not known at this time, but from the clinical point of view, the practical value of what is known is not great. We may have two cases of identical bleeding which require different endocrine therapy.

Evidence is accumulating that a hematopoietic hormone is in existence and since each one has an antagonist—another physiological principle—a specific hemorrhagic one may be present also.

These illustrative cases are few and I am well aware of the fact that one swallow does not make a summer. As far as I know this is a new theory concerning some of these types of bleeding. My observations lead me to the conclusion that bleeding of this character is endocrine in nature and if it is possible to upset the endocrine status as it exists while the bleeding is present, not correct it but change it, the bleeding will stop. This, of course, negates the idea that the agents I have used so far have any specific action.

Failures may be due to the inability to change the endocrine make-up. With our present inexact knowledge of the physiology of the endocrines we are unable to properly evaluate the endocrine status as it relates to the blood of any individual. Endocrine measurements for individuals may be as different as their personalities or faces. Hence, in the attempts to change the conditions, at times we might be accentuating the malignant factors already present.

CARCINOMA OF THE CERVIX: STATISTICAL ANALYSIS OF THE CASES SEEN AT THE MEDICAL COLLEGE OF VIRGINIA.*

RANDOLPH H. HOGE, M.D.,
Richmond, Virginia.

This paper is an analysis of the new cases of carcinoma of the cervix seen on the service at the Medical College of Virginia during the past ten years, a period beginning on April 1, 1930, and ending on March 31, 1940. Only cases in which there was a histologic confirmation of the diagnosis were included. Accordingly, a few cases admitted during this period were omitted from this study. These omitted cases were not great in number and occurred, for the most part, in the earlier years of the period covered, in patients in whom the gross diagnosis was obvious. It is the practice at the present time to have biopsy confirmation in all cases.

The number of proven cases thus selected during this period totaled 237, and accordingly formed the material for this report.

From the Departments of Surgery and Gynecology, Medical College of Virginia.

*Read before the Richmond Academy of Medicine, Richmond, Va., April 23, 1940.

The series of cases was analyzed with respect to the annual, racial, age, stage, and grade distributions. The presence of syphilis and the condition of parity were noted and recorded, because of the possibility of these conditions being agents in the production of chronic irritation and thus being possible factors in the etiology of carcinoma.

Annual Distribution: When the cases were separated according to the year in which each case was first admitted to the hospital for carcinoma of the cervix, the result showed a striking rise in the number of cases admitted annually during the period under study. Whereas only nine patients were admitted during the last nine months of 1930, or an estimated twelve cases for the entire year, and while only nine cases were admitted during 1931, there then was shown a marked increase in these admissions, so that finally in 1939 forty-three such cases were admitted. The number of carcinoma of the cervix admissions

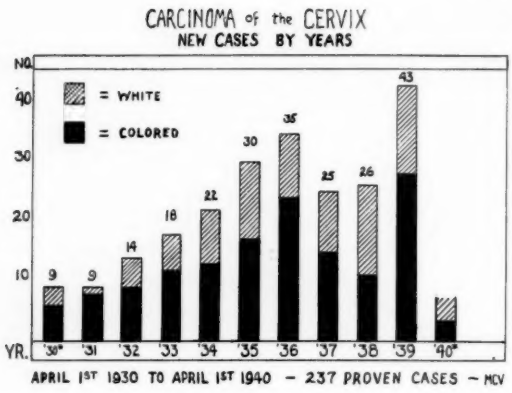

CHART I.

again, it became desirable to compare these figures with those for the general hospital population. It was found that during the past ten years there were 52,685 general white and 40,475 general negro admissions to St. Philip, Memorial, and Dooley Hospitals. These figures included men, women and children of both races, as it was not possible to procure separate figures for women. Thus, the white patients admitted were in excess of the colored. Therefore, the higher number of colored carcinoma of the cervix cases could not be accounted for by a greater number of colored admissions, as the latter condition did not obtain.

Age Incidence: The youngest case in this series was that of a colored girl of twenty-four years.

TABLE 1.

NEW CASES OF CARCINOMA OF THE CERVIX ADMITTED

	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
White	3	1	5	6	9	13	11	10	15	15	3
Colored	6	8	9	12	13	17	24	15	11	28	3
Total	9*	9	14	18	22	30	35	25	26	43	6†

*Nine months only. †Three months only.

in 1939 was therefore 300 per cent to 400 per cent of the number of similar admissions in 1930 and in 1931, respectively.

Chart I and Table 1 illustrate the increase in cases, and show also the relative number of white and negro cases, a subject to be spoken of later.

It immediately became interesting to know whether there was a corresponding increase in the number of general admissions to the hospital during the same period. Examination of the figures for general admissions to St. Philip and Memorial Hospitals showed that there was not a correspondingly great rise in these admissions. The number of general admissions to these hospitals rose from 7,729 for the twelve months of 1930 to 9,972 for the year of 1939, an increase of approximately 30 per cent. The relative increase in the cases of carcinoma of the cervix was therefore approximately ten times greater.

There was a white girl of twenty-five years. One colored woman gave her age as eighty, and one white woman was seventy-nine. These were the two oldest cases. When the ages were divided into decades it

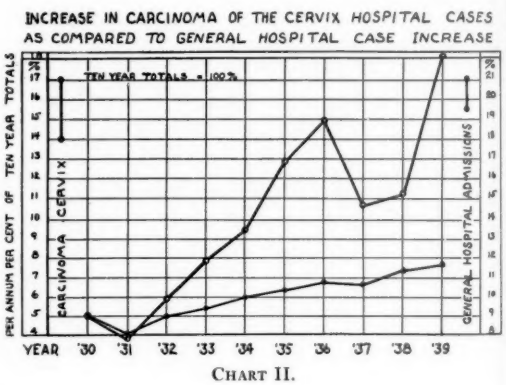

CHART II.

TABLE 2.

GENERAL ADMISSIONS TO MEMORIAL AND ST. PHILIP HOSPITALS

1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
7729	6858	7795	8082	8458	8829	9146	9106	9643	9972

Race Incidence: It has been noteworthy in observing this series that the number of cases occurring in the colored race has been considerably in excess of that in the white race. Of the 237 herein reported, 146, or 62 per cent, were in the colored race. Here, was found that 7 per cent were in the third decade. The fourth decade showed a marked increase, reaching 27 per cent. The highest incidence was in the fifth decade, 30 per cent occurring during this period. Twenty-four per cent of the cases occurred in the

TABLE 2-A.
COMPARISON OF WHITE AND COLORED ADMISSIONS FOR TEN-YEAR PERIOD

	CARCINOMA OF CERVIX		GENERAL ADMISSIONS	
	NUMBER	%	NUMBER	%
White	91	38	52,685	57
Colored	146	62	40,475	43
Total	237	100	93,160	100

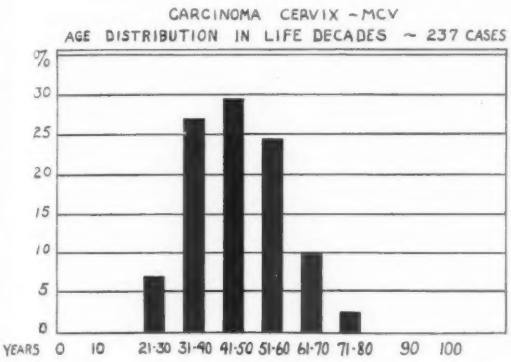

CHART III.

of the cervix. For the sake of uniformity in world-wide reports, the League of Nations, in 1929, adopted definitions of stages in this disease. This organization in that year divided the stages into four groups as follows:

Stage I. The growth is strictly limited to the cervix uteri. Uterus mobile.

Stage II. Lesions spreading into one or more fornices, with or without infiltration of the parametrium adjacent to the uterus, the uterus retaining some degree of mobility.

Stage III. (a) Nodular infiltration of the parametria on one or both sides extending to the wall of the

TABLE 3.

DECADES	1ST	2ND	3RD	4TH	5TH	6TH	7TH	8TH	9TH	10TH
Number	0	0	16	64	70	58	23	6	0	0
Per cent	0	0	7%	27%	29.5%	24.5%	9.7%	2.5%	0	0

sixth decade. Following this there was a rapid drop.

We had gained the impression that not only were the colored cases more frequent but also that the disease tended to occur at a somewhat earlier age in the colored race. When separate curves were made of the age distribution in the two races, there was considerable similarity in the two curves. However, the comparison showed that the disease did tend to occur at a slightly earlier age in the colored group in our series. In these curves the ages were broken up into five-year groups. The figures show that in each race the highest incidence was in the group thirty-six to forty years.

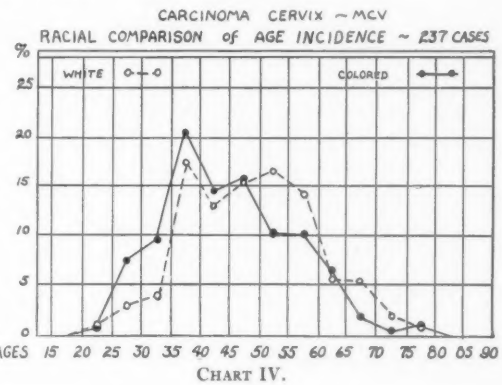

CHART IV.

TABLE 4.

AGE GROUP	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-75	76-80
Number of Cases:												
White	1	3	4	16	12	14	15	13	5	5	2	1
Colored	1	11	14	30	21	23	15	15	10	3	1	2
Total	2	14	18	46	33	37	30	28	15	8	3	3
Per cent:												
White	1%	3%	4%	18%	13%	16%	17%	14%	6%	6%	2%	1%
Colored	1%	8%	10%	21%	14%	16%	10%	10%	7%	2%	1%	1%

Stage of the Disease: The stage of the disease at the time of treatment is perhaps the most important single factor of prognostic importance in carcinoma pelvis, with limited mobility of the uterus or massive infiltration of one parametrium with fixation of the uterus.

(b) More or less superficial infiltration of a large part of the vagina, with a mobile uterus.

(c) Isolated metastases in the pelvic glands, with a relatively small primary growth.

(d) Isolated metastases in the lower part of the vagina.

Stage IV. (a) Cases with massive infiltration of both parametria extending to the walls of the pelvis.

(b) Carcinoma involving the bladder or rectum.

(c) The whole vagina infiltrated (rigid vaginal passage), or one vaginal wall infiltrated along its whole length, with fixation of the primary growth.

(d) Remote metastases.

In 1937 the League of Nations modified somewhat these definitions.

In our series of cases it was possible, by original examination or by study of the records, to estimate the stage in 220 of the cases. Following the League of Nations' definition of 1929, these 220 cases were divided into the four stages as follows:

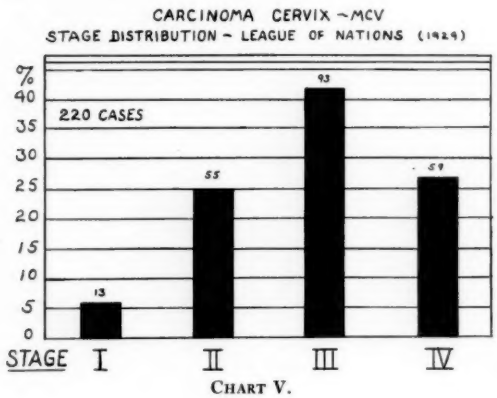

CHART V.

TABLE 5.

STAGE OF DISEASE (LEAGUE OF NATIONS, 1929)

STAGE	I	II	III	IV	TOTAL
Number	13	55	93	59	220
Per cent	6%	25%	42%	27%	100%

It is seen that only 6 per cent were in the most favorable or so-called operable group. Twenty-five per cent were in the group of so-called border-line operability. Sixty-nine per cent, or two-thirds of the cases, were in the advanced stages, represented by III and IV. Grouped according to race, 75 per cent of the colored cases were in stages III and IV, and 58 per cent of the white cases were in these two stages.

Cell Type and Grade: Of the 237 cases in this series, eight, or 3 per cent, had adenocarcinoma. Two hundred and twenty-nine, or 97 per cent, had squamous cell carcinoma.

In 186 cases the Department of Pathology graded the carcinoma according to the Broders' classification, many being graded by Dr. Broders himself. This grading classifies the cases according to the degree of malignancy, as indicated by the histologic picture. The distribution of cases in our series by this method was as follows:

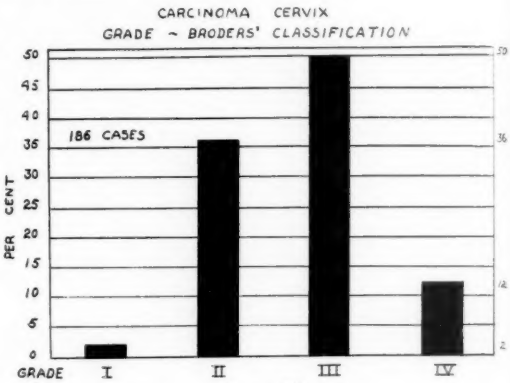

CHART VI.

TABLE 6.

GRADE OF MALIGNANCY, BRODERS

GRADE	I	II	III	IV	TOTAL
Number	3	67	93	23	186
Per cent	2%	36%	50%	12%	100%

Syphilis: The possible role of syphilis in predisposing to carcinoma of the cervix was considered. It was determined how many of these cases had syphilis so far as the presence of a positive serum test indicated the latter disease. The Wassermann or Kline reactions were recorded on 221 of the cases in this series. Twenty-two per cent of these cases had positive reactions. Divided into races the reaction was positive in 8 per cent of the white cases and in 30 per cent of the negro cases.

It became of interest to compare these figures with a comparable group of cases which did not have carcinoma of the cervix. For this comparison, figures obtained from Dr. Wampler were used. He studied the cases first reporting to the Medical Clinic of the Medical College of Virginia Out-Patient Department from January, 1929, to December, 1933. He found that 29.2 per cent of the colored women and 4.8 per cent of the white women had positive Wassermann reactions. Of both groups 18.8 per cent had positive Wassermann reactions.

These figures of Dr. Wampler's were very close to

those found for the carcinoma of the cervix cases, the latter being only slightly higher in each instance.

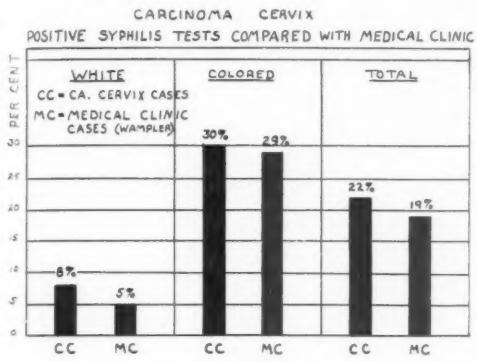

CHART VII.

TABLE 7.

POSITIVE WASSERMANN OR KLINE REACTIONS

	WHITE	COLORED	BOTH
Carcinoma of cervix	8%	30%	22%
Medical Clinic (Dr. Wampler)	4.8%	29.2%	18.8%

Parity: Childbirth produces cervical lacerations which might become infected and be the cause of chronic irritation. Only between 4 per cent and 5 per cent of our cases were nulliparous. However, in a collected series of 1,289 cases reported by Lynch, 15.3 per cent were nulliparous. The nulliparous portion of the adult female population, based on the figures of the 1930 United States census quoted by Lynch, was between 10 and 20 per cent.

Family History: The study of the family history in these cases seems to be of little value. It is probable that very few people have accurate knowledge of what other members of their family died of. In 16 per cent of these cases there was no family history recorded. A positive family history was obtained in only 7 to 8 per cent of the cases. In a series of 375 cases, Lynch found a positive family history in 28 per cent.

The "normal incidence" of cancer, based on a study by Dublin of the Metropolitan Life Insurance Company, was 6 per cent.

SUMMARY

Two hundred and thirty-seven cases of proven carcinoma of the cervix, admitted to the Hospital Division of the Medical College of Virginia during the ten-year period, April 1, 1930, to March 31, 1940, have been statistically analyzed with respect to annual distribution and to race, age, stage, and grade incidence, and with attention to the presence of syphilis, parity, and a positive family history.

CONCLUSION

It was the purpose of this paper to present the figures which have been presented herein, and no attempt was made within this paper to speculate upon the meaning of the figures presented. Due to the limited number of cases in this series, the figures herein obtained would be best considered in conjunction with reports from elsewhere as only a part of a collected series of much larger dimensions.

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FREQUENCY OF SPINA BIFIDA.

HENRY G. HADLEY, M.D.,
Washington, D. C.

To determine the relative frequency and degree of the abnormalities of the spine, a series of 1,500 consecutive cases have been carefully studied by complete physical, laboratory, and X-ray examinations. Two hundred and thirty-five of these 1,500 were found to have definite congenital or acquired abnormalities of the spine. In addition to these 235, there were 110 cases of spinal arthritis, two cases of tuberculosis, and two of metastatic carcinoma. The frequency of arthritis bears some relation to spinal

abnormalities, for, though its frequency in the total group was only 7.03 per cent, it was present in 14.88 per cent (thirty-five of the 119) of those having abnormalities. Where a congenital defect was present, there was a higher incidence of acquired defects, there being eighty-four acquired and 179 congenital defects in the 235 spinal columns, twenty-eight of the congenital having also an acquired defect. The frequency of acquired defects in the total group of 1,500 was 5.6 per cent. In the subgroup that had no congenital anomalies, the frequency was only 4.52 per cent, in contrast with a frequency of 10.72 per cent in the subgroup that had congenital anomalies.

The abnormalities found in the order of their frequency were:

	NUMBER
1. Spina bifida (3 cervical, 3 thoracic, and 3 lumbar)	83
2. Scoliosis (of a degree sufficient to be called definitely abnormal)	62
3. Sacralization of the 5th lumbar vertebra (8 complete)	63
4. Incomplete bilateral sacralization	12
5. Unilateral sacralization	32
6. Partial sacralization	11
7. Lordosis	33
8. Kyphosis	11
9. Lumbarization of the first sacral vertebra	25
10. Lumbar ribs	10
11. Abnormalities of the fifth lumbar veterbra	12
12. Cervical ribs	5
13. Disc abnormalities	2
14. Blocked vertebra (1 cervical and 1 lumbar)	2
15. Klippel-Feil syndrome with absence of two cervical vertebrae	1
16. Sprengel's deformity	1
17. Hemivertebra	1
18. Spondylolisthesis	1

Donaldson lists those found by him in the following order:[1]

1. Sacralization of the fifth lumbar vertebra.
2. Lumbarization of the first sacral vertebra.
3. Cervical rib.
4. Unilateral anomalous development of the sacrum.
5. Spina bifida.
6. Variation in number of thoracic ribs.
7. Sprengel's deformity.
8. Intercalation of a whole or portion of a vertebra.
9. Nondevelopment of one side of the centrum.
10. Fusion of two vertebrae without formation of the disc.

This series of 1,500 roentgenological examinations of the spine revealed eighty-three, or 5.53 per cent, definite bifida. Giles[2] found 23.9 per cent, although these may not all have been actually spina bifida occulta if he included minor posterior fusion defects of the first sacral vertebra. Theodora Wheeler[3] found 23 per cent bifida of the last lumbar and 13 per cent of the first sacral vertebra. These figures probably include minor posterior fusion defects.

The term was first used by Nicolaas Tulp,[4] a Dutch physician, who found six cases with an external mass. He performed operations upon three of these cases, all of whom died. His conclusion was that "surgeons should not open such a tumor and should carefully avoid the bad reputation which will invariably result from doing so." Tulp, in 1632, was the subject of Rembrandt's "Anatomy" at the Hague. He wore the short lace-edged collar which was a sign of wealth or distinction.[5]

In this series, which were almost entirely adults, there was only one spina bifida cystica which was in a man thirty-two years of age. This defect originated in a cleft of the second thoracic vertebra. It was a meningocele, as are nearly all spina bifidas above the lumbar region. Surgeons often have hesitated to operate upon meningoceles for fear of the development of hydrocephalus. Cutler[6] stated that "while modern surgery has made amputation of the sac safe from meningitis, it may be justly accused of causing death by hydrocephalus." While the cerebrospinal fluid is formed from the choroid plexus, it is absorbed by the arachnoid tissue, and, where the sac is amputated, some absorbing tissue is taken away. But if the meningocele sac is dissected out and all the arachnoid tissue is preserved, hydrocephalus does not develop post-operatively.[7] The location of the bifida in a thoracic-vertebra is not common. Wheeler[8] found no evidence of spina bifida in 3,000 thoracic vertebrae. Sunderland[9] in a series of 12,000 cases found 1.17 per cent of the five lumbar and 3.6 per cent of the first and second sacral vertebra.

Spina bifida occulta is a developmental deformity in which there is a cleft in the lamina of one or more vertebra without any external sac. While there is no external malformation of the spinal cord or the meninges, there may be external manifestations, such as hypertrichosis, which is the most striking, but the occurrence of which is only in 4 per cent. Virchow, in 1875, was the first to demonstrate this association of hypertrichosis with an opening in the vertebra.[10]

Other signs such as a subcutaneous lipoma, a

telangiectasis, or a dimple on the skin, may mark the underlying defect in the vertebral arch. In the four cases of this series of cervical and thoracic involvement, hypertrichosis was found in one, a lipoma with telangiectasis in one, and a dimple of the skin in another. The other case had an associated Sprengel's deformity to call attention to the defect.

Bony closure of the posterior vertebral arches begins in the lumbar region and proceeds upward and downward. Ossification begins at birth or earlier, and the spinous processes of the lumbar and first sacral vertebra are ossified by the third year.

The great majority of the cases of spina bifida occulta are in the lumbosacral region, leaving a gap at the site of the spinous process produced by non-fusion of the lamina. While many defects appear to be harmless, the study of the entire series shows that this abnormality must be considered a factor for potential trouble. The defect may be in the median line, or, as in ten cases of this series, to one or the other side. This defect, which encroaches upon the lamina and may involve the inferior articular processes, must therefore cause a loss in the stability of the vertebral column, both from the loss of articular surface and from the lack of bone surface to which important muscles and ligaments are usually attached. Stability may also be affected by the change in ligamentous attachments, especially the interspinous ligaments, which lack the anchorage of the spinous process. This admits of an excess of mobility of the spinal column, with consequent damage to other structures by strains and sprains. Scoliosis was found present in fourteen of the eighty-three cases, or 16.84 per cent of the cases of spina bifida, while in the remaining 1,417 only twenty-nine additional cases were found. Lordosis was associated with four of the eighty-three (4.97 per cent) cases of spina bifida, lumbarization with nine, and sacralization with four.

Von Recklinghausen[11] was responsible for first calling attention to the associated abnormalities of spina bifida occulta by his case of congenital clubfoot, hypertrichosis, and spina bifida occulta. Since the spine grows faster than the cauda equina, symptoms due to stretching of the roots may not appear until adolescence or adult life. Clubfeet of the different varieties (pes cavus, pes planus, talipes varus, and valgus) are so often associated with spina bifida, spina bifida occulta being present in 60 per cent, that every case of clubfeet should have an X-ray examination of the lower spinal column. Syringomyelia,[12] trophedema, and perforating ulcer have been frequently due to nerve lesions caused by spina bifida occulta. Another important result of spina bifida is urinary incontinence and enuresis. Sixty-eight per cent of all adults suffering with nocturnal enuresis have spina bifida occulta, and of these 50 per cent are curable by operation.[13] There may be anesthesia involving the buttocks and the perineum. Uterine prolapse of nulliparae is nearly always due to a spina bifida occulta by involvement of the fourth sacral nerve, with consequent paralysis of the levator ani muscles.

Lumbosacral pains are frequently found in individuals with spina bifida occulta, and the question arises as to whether there is a cause-and-effect relationship. Many having clefts of the neural arch have no pains, and it is apparent that they have sufficient compensation for this deficiency, especially in earlier years when the spine is more flexible and the muscular development more adequate. However, in a majority of cases, careful inquiry will elicit a definite history of physical limitation, especially if certain strenuous exercises or movements are performed. In this group, there were twenty-two patients (or 26.7 per cent) complaining of lumbosacral pains or recurrent attacks of sciatica, while the percentage in the whole series was only 4.1 per cent. These cases have a higher perdisposition to strain, sprains, and spondylolisthesis.[14]

The cause is evidently not related to hydrocephalus or internal pressure, as this developmental anomaly has taken place before the cerebrospinal fluid is formed from the choroid plexus. The choroid plexus does not begin to secrete fluid until about the tenth week, while the neural tube is completely closed at about the end of the third week of embryonic life. It is a complex fundamental process concerned with the development and cleavage of the tissues of the spinal cord, meninges, and perineural tissues. Hertwig[15] has produced experimental evidence that the altering of the physical or chemical environment of embryos by using toxic substances or exposure to X-ray or ultraviolet rays will produce malformations of the central nervous system such as spina bifida and related developmental defects. It appears to be acquired and not inherited. Woltman[16] found in a review of 187 cases, including the three associated cases of myelodysplasia without demonstrable bone defect, only ten with a history of any form of congenital defect.

XUM

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1252 Sixth Street, S.W.

REPORT OF A CASE OF DIABETIC COMA COMPLICATED BY PNEUMONIA.

C. D. NOFSINGER, M.D.,
and
B. KATZEN, M.D.,
Roanoke, Virginia.

This patient was an under-nourished, asthenic white male, sixteen years of age, who was admitted to the Lewis-Gale Hospital on November 20, 1939, at 6 P. M., in a comatose state. On admission, the history obtained from his parents was as follows:

The patient had been in coma since 11 A. M. There was a history of a respiratory infection, beginning about ten days before his admission to the hospital. The parents stated that he had been complaining of some weakness with general malaise for some weeks previous to the onset of coma. For several months he had had frequency of micturition, particularly at night, and had been drinking large quantities of water. During the past six months, he had lost from ten to fifteen pounds in weight. A history was obtained that he was not seen by a physician until he had passed into coma.

Examination revealed a white male, approximately sixteen years old, very much under-nourished, in a state of deep coma and shock. Rectal temperature on admission was 101°. The skin was definitely dry, both the upper and lower extremities were cold, and the pulse was barely perceptible at the wrist. The pupils were contracted and reacted sluggishly to light. The eye balls were soft. The nose and throat were essentially negative. Respiration was definitely increased, but the respiratory movements were of short excursion. The lungs revealed evidence of a definite lobar pneumonia in the right base, posteriorly. The heart rate was markedly increased, being 130 at the time of admission; the muscular element was fair, and no murmurs could be elicited. An accurate blood pressure could not be obtained due to the severe degree of shock. Examination of the abdomen revealed evidences of upper abdominal distention, but there was no rigidity present. The deep reflexes were very much diminished, and there was no response on the part of the patient to any type of external stimuli. There was no rigidity of the muscles of the neck and back.

Although a diagnosis of diabetes mellitus had not previously been made, from the history obtained from the parents and from the clinical findings it was our impression that this patient had pneumonia, com-

plicated by diabetic coma. The patient was immediately catheterized; however, there was no urine present in the bladder although the mother stated that he had not voided since early morning. The catheter was left in the bladder, and 1,000 c.c. of normal saline was then given intravenously. In a few minutes after the saline solution was begun, sufficient urine was obtained for examination which revealed the presence of sugar, acetone, and diacetic acid. The patient was then given 60 units of insulin subcutaneously. Two hours later, he was again given 40 units of insulin and a 5 per cent solution of dextrose in saline. Approximately the same amounts of insulin and saline with dextrose were given at four-hour intervals until morning.

At 8 A. M. the patient was slightly improved and responded slowly to questioning. The pulse rate had dropped from 130 to 110, and the blood pressure was 80/50. The blood sugar estimation at 8 A. M. was 290 mgm. per 100 c.c. of blood. The blood urea estimation at the same time revealed a dehydration urea retention of 160 mgm. per 100 c.c. of blood. X-ray examination of the chest was taken at this time and revealed lobar pneumonia at the base of the right lung. Thirty-five units of insulin and 1,000 c.c. of 5 per cent dextrose in saline were continued at six-hour intervals. By noon of the first hospital day, the patient was able to take fluids by mouth, and he was then started on sulfapyridine.

Second Hospital Day: At 6 A. M. of the second day, the patient was given 1,000 c.c. of 5 per cent dextrose in saline and 25 units of insulin. At that time his general condition appeared much improved, although his response to questioning was still slow. An attempt was made to place the patient on a semi-liquid diet with adequate insulin, but at 8 P. M. on the evening of the second day it was noted that the patient had again passed into a semi-comatose state. The possibility of insufficient saline administration during the twelve-hour period was brought to mind, and the patient was immediately given intravenous saline. A decided improvement was noted on the completion of this administration.

Third Hospital Day: The patient was definitely improved, apparently more rational, and answered questions more readily. Blood sugar estimation at 8 A. M. was 80 mgm. per 100 c.c. of blood. At this time the patient's heart rate was 110, and his blood pressure was 95/70. Since he could take nourishment by mouth, he was given a semi-soft diet containing approximately 1,100 calories, with 20 units of insulin before each feeding.

The patient at this time developed a dermatitis medicamentosa which was probably due to sulfapyridine, and the drug was discontinued. He also developed symptoms of a peripheral neuritis, and since there was evidence of a vitamin B_1 deficiency, he was given 20 mg. of thiamine chloride three times daily.

Fourth to Fourteenth Hospital Days: For the next ten days, his improvement was rapid; however, the lung findings remained unchanged, both by physical and X-ray examination. His temperature ranged from 99° in the morning to 101° in the evening.

Fourteenth Hospital Day: The patient developed a sharp pain in the lower right chest, and his temperature arose to 102°. Physical and X-ray examination at this time revealed evidences of a pleurisy of the right side.

Sixteenth Hospital Day: There were physical findings of a pleural effusion on the right side, and an aspiration was done with the resultant withdrawal of 300 c.c. of straw-colored fluid tinged with blood. Laboratory examination of the fluid revealed an occasional lymphocyte and polymorphonuclear leukocyte. No bacteria were found. From this point, the patient continued to run a temperature ranging from 100° in the morning to 102° in the evening. Repeated aspirations were done; however, very little fluid was withdrawn at any one aspiration.

After one week, the patient was again aspirated, and purulent material was withdrawn. Microscopic examination revealed the presence of numerous pneumococci which were non-typeable. At this time the patient was transfused, and the pleural effusion was drained by the use of a Lloyd's catheter. Immediately after drainage was established, he had a temporary return of his temperature to normal. Irrigations of the pleural cavity with Dakin's solution were begun; however, it might be stated that the patient failed to respond as one would desire.

Because of the fact that we had previously obtained pneumococci by smear and culture from this fluid, it was decided that irrigations of the pleural cavity with a solution of sulfanilamide and sulfapyridine combined should be done. These irrigations were instituted. The patient's temperature returned to normal immediately and remained there until his dismissal from the hospital. After removal of the tubes, there was very little drainage for the next few days, and the wound healed rapidly. He was dis-

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missed from the hospital on February 1, 1940.

It may be stated that during the interval in which the patient was developing numerous complications, his blood sugar had always been well in hand, and his diabetes had been under control. As the infection responded to therapy, the patient required less and less insulin, and since his dismissal from the hospital, his insulin requirement ranges from 25 to 30 units of protamine insulin in twenty-four hours. Examination of his chest on June 30, 1940, revealed normal lung findings. His weight at this time showed a gain of nine pounds.

COMMENTS

It may be stated that this case has presented numerous interesting phenomena. First: A patient who had previously shown moderate symptoms of diabetes mellitus was thrown into a profound diabetic coma by a respiratory infection. Second: Massive doses of insulin were required to bring this patient out of coma. Third: The value and necessity of intravenous saline in the handling of a patient in diabetic coma was demonstrated. It may be seen on reviewing the case that, on withdrawal of the saline, the patient again went into a semi-comatose state. However, following the administration of further saline, he recovered immediately. Fourth: The value of vitamin B_1 in the handling of a case of diabetic acidosis was evident. It has already been shown that a deficiency in vitamin B_1 storage is present in individuals in diabetic coma; and with the administration of large quantities of carbohydrates, there is a further demand for B_1, thereby bringing about a definite B_1 deficiency. Consequently, it would seem that the administration of vitamin B_1 parenterally is beneficial in the treatment of a case of diabetic coma. And last, but not least, the value of sulfanilamide and sulfapyridine irrigations in empyema due to organisms which respond to these drugs is emphasized.

Lewis-Gale Hospital.

HYDRAMNIOS—BRIEF REVIEW OF THE LITERATURE WITH REPORT OF TWO CASES.*

C. L. RILEY, M.D.,
Winchester, Virginia,
and
F. T. HAUSER, M.D.,
Purcellville, Virginia.

The average amount of amniotic fluid is about 1,000 cubic centimeters and quantities up to 2 or 3 liters are not infrequent; however, very large amounts —30 liters have been reported—are not common, and, because of the severe complications which often accompany an acute hydramnios, we believe that a brief reconsideration of the subject will be of value to all who may be called upon to deal with obstetrical difficulties.

The etiology of hydramnios is unknown; obviously, it must be due to either excessive formation and/or deficient absorption of amniotic fluid. Among the etiological factors suggested are:

1. Malformation of the fetus. The excessive amount of fluid being due to transudation from insufficiently covered blood vessels.

2. Conditions obstructing venous circulation in the fetus.

3. Conditions causing an increase in the amount of fetal urine.

4. Amnionitis leading to inflammatory and degenerative changes of the amnion.

Chronic hydramnios with a gradual accumulation of a moderate excess of amniotic fluid is not unusual; however, an acute hydramnios usually beginning during the latter part of the second trimester of pregnancy is very rare.

It has been suggested by Goodall *et al* that in many cases inflammation of the amnion will explain the formation of hydramnios as well as the type of associated anomalies. Suggested pathological physiology is as follows: the primitive neural tube is formed by the folding of the neural plate into an epithelial tube. This groove begins to close in embryos of four weeks near the middle of the body, and closure advances in both directions, the neuroporic openings at each end of the neural tube closing last, soon after the fourth week. Consequently, it is sug-

*Read before the staff of The Winchester Memorial Hospital.

gested that infection of the amnion after closure of the neural tube would give rise to an increase in the amount of fluid and formation of adhesions, but that normal babies or those with deformities resulting from adhesions would be expected, whereas, infection of the amnion before closure of the neural tube and subsequently gaining access to the tube, would lead to deformities depending upon the stage of development of the neural tube. Infection in the neural tube occurring before closure of the tube would cause hypersecretion and increased spinal pressure, and, therefore, incomplete closure with the formation of spina bifida. Very early infection in the neural tube would inhibit normal growth of nervous tissue with the formation of anencephaly. Our two cases seem to lend support to this theory; however, it must be remembered that hydramnios does occur in the absence of fetal deformity, and in the absence of any demonstrable infection of the amnion. The findings of Dr. Murray Angenine, of New York, revealed that, of fifteen pregnancies with anencephalic monsters, ten had hydramnios, and, of nine cases examined, five revealed the presence of choroid plexus tissue at the brain site, which still leaves the question as to whether an early infection of the amnion and neural tube gave rise to hydramnios and the anomalies or whether exposed blood vessels at the site of the anomalies caused hydramnios. Experiments of Dr. Carmac Rivett—(a) Injection of indigo carmine into liquor amnii with none recovered in mother's urine, (b) Insulin injected into liquor amnii with no effect on blood sugar of mother—would seem to lead one to wonder about the frequency of metastatic infection of the amnion which, as a reversible phenomenon, is difficult to prove.

Symptoms arising from the greatly increased size of the uterus are: pain in the back, abdomen, thighs and legs, edema of the lower extremities, dyspnea, and, not infrequently, nausea and vomiting. The uterus is abnormally large and the abdomen is distended, tight, and tender.

When considering the treatment of this condition, the dangers associated with the release of amniotic fluid must be carefully considered. Sudden evacuation of the fluid frequently causes severe shock and if a premature separation of the placenta occurs, which not infrequently happens, the shock is further accentuated. Prolapse of the cord may be a serious complication. Abnormal distention of the uterus with loss of contractile power often causes post-partum hemorrhage.

Repeated paracentesis uteri has been suggested by physicians on the continent and Dr. Carmac Rivett reported ten cases with very satisfactory results. Other writers, too, have reported similar results. Any evidence of fetal anomaly would certainly lessen indications for this procedure. Dr. Krahula in 1921, collected the records of a series of patients with hydramnios and, of 151 single deliveries, sixty-four pairs of twins, and three cases of triplets, 103 were still-born and seventy-six died soon after birth. Thus, we see that our present methods of treatment leave much to be desired.

Treatment in this country continues to be limited largely to artificial rupture of the membranes, allowing the fluid to escape very slowly, oxytocics and complete packing of the uterine cavity following delivery. Intravenous fluids, including transfusions, are used, if needed, for shock and hemorrhage.

Case 1: GIII, PII, MO, age twenty-four years. Referred to the Hospital Division of the Medical College of Virginia, 9-8-36, becuase of pregnancy complicated by an abnormal progressive enlargement of the abdomen, dyspnea, tenderness of the abdomen, and pain in the lower extremities. L. M. P. January 15, 1936. At term October 22, 1936. Obstetrical history not significant except for a mild toxemia during the first pregnancy.

Two weeks prior to admission the patient noticed that her abdomen was becoming very large and she soon began to develop symptoms resulting from abdominal distention. Physical examination revealed an excessive enlargement of the abdomen due to an acute hydramnios. Fetal heart sounds not audible, B. P. 138/85.

Following artificial rupture of the membranes, 5,500 cubic centimeters of amniotic fluid were allowed to slowly drain from the uterus. Soon after removal of the fluid uterine contractions became very strong and frequent, giving rise to a complete premature separation of the placenta. A still-born fetus and the placenta delivered spontaneously accompanied by rather severe vaginal bleeding. Hemorrhage was controlled by complete packing of the uterine cavity and shock combated by giving intravenous fluids and other supportive treatment. There was no fetal deformity. Pathological examination of the placenta revealed a chronic decidual endometritis.

Case 2: GI, PO, MO, age nineteen years. This

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patient was first seen by Dr. F. T. Hauser, of Purcellville, Virginia, in January, 1940. At that time she had an upper respiratory infection and stated that she had been having similar trouble for several weeks. L.M.P. August 7, 1939. Term May 14, 1940.

She was seen again in February at which time the abdomen was much distended and the patient complained of dyspnea and pain in the lower extremities.

The membranes ruptured that same afternoon with a sudden escape of a very large quantity of amniotic fluid. A stillborn fetus and the placenta delivered spontaneously. The uterus contracted satisfactorily under the influence of oxytocics and remained so for several hours, following which complete relaxation occurred. Vaginal bleeding became rather profuse and the patient was referred to the Winchester Hospital. Physical and laboratory examinations revealed a severe secondary anemia: R. B. C. 1,910,000, Hb. 40 per cent, vaginal bleeding, and a relaxed uterus filling the entire lower abdomen. Following transfusion, a large amount of clotted blood was removed from the vagina and uterus and the uterine cavity completely packed. Convalescence was uneventful except for persistence of a mild upper respiratory infection. Many fingers and toes of the fetus were amputated and others deformed.

SUMMARY

Acute hydramnios is a very rare but serious complication of pregnancy. Two cases, one with a persistent upper respiratory infection, which may have acted as a focus of infection, and another with a chronic decidual endometritis have been presented. Amnionitis occurring after closure of the neural tube may have been the etiological factor in these two cases. Each case represents one of the more serious complications which may occur in the presence of an acute hydramnios. Treatment for this condition, even when occurring late in pregnancy, is not satisfactory and the possibility of premature separation of the placenta, postportum hemorrhage and shock must be recognized.

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DISCUSSION

DR. L. M. ALLEN: I am, of course, interested in the etiology of hydramnios but the practical part is the treatment, and in this country, this is artificial rupture of the membranes with slow removal of the amniotic fluid.

Personally, I have not had any cases of premature separation of the placenta associated with this condition. My opinion of the second case reported is that the patient bled because the uterus did not contract and remain contracted satisfactorily.

It is necessary to watch carefully and see that the uterus remains contracted. The after-care of the patient is very important, and careful watching to be sure that the uterus contracts properly is necessary. These patients need time and must not be delivered too quickly; slow delivery is Nature's method of counteracting this condition.

Slow removal of the amniotic fluid, slow delivery, and careful observation of the patient for quite a long time following labor will prevent complications.

Correspondence

Growth of Hospitalization in Richmond, Virginia, and United States (1920-1940).

December 10, 1940.

TO THE EDITOR:

In compliance with your request for statistics for your use in the VIRGINIA MEDICAL MONTHLY, I am enclosing a graph which depicts what has occurred in the United States of America, in Virginia and in Richmond, since 1920 through 1939; also statistics on the Richmond Hospital Service Association beginning with January, 1936.

For each of the units of population on the graph is shown the total beds, the percentage of increase in beds since 1930, the number of admissions to hospitals, the increase in admissions since 1934, the average stay of patients, the percentage of occupancy of patients and the ratio of admissions to the population.

It seems pertinent to make certain observations regarding this graph. You are, I am sure, familiar with the hospital number of *The Journal A.M.A.* Their March 30, 1940 issue, page 1160-1161 shows the number of general hospital beds per thousand of

TABLE FOR GROWTH OF HOSPITALIZATION IN RICHMOND, VIRGINIA, AND THE UNITED STATES

	1920	1925	1928	1930	1932	1934	1935	1936	1937	1938	1939
RICHMOND											
Total beds	1,046	.....	1,011	1,000	1,015	987	987	1,002	1,020	1,074	1,073
% increase since 1930	.....	.....	.....	.....	1%	—1%	—1%	0	2%	7%	7%
% of occupancy	61%	72%	.....	64%	66%	67%	72%	75%	80%	77%	83%
Admissions	.....	.....	.....	.....	22,079	21,777	22,658	25,220	27,260	27,628	29,507
% increase of admissions since 1934	.....	.....	.....	.....	.....	.....	4%	11%	25%	27%	36%
Ratio admission to population	.....	.....	.....	1 in 9	.....	.....	1 in 9	1 in 8	1 in 7	1 in 7	1 in 7
Average stay	.....	.....	.....	.....	.....	.....	11 days	11 days	11 days	11 days	11 days
VIRGINIA											
Total beds	4,768	.....	5,815	5,846	7,389	6,428	6,640	6,433	6,951	7,593	7,813
% increase since 1930	.....	.....	.....	.....	24%	10%	14%	10%	19%	30%	33%
% of occupancy	67%	61%	.....	60%	61%	57%	58%	64%	71%	66%	65%
Admissions	.....	.....	.....	.....	105,647	95,129	106,714	120,582	136,661	136,923	151,156
% increase of admissions since 1934	.....	.....	.....	.....	.....	.....	12%	27%	43%	44%	59%
Ratio admission to population	.....	.....	.....	.....	1 in 23	.....	1 in 23	1 in 20	1 in 18	1 in 18	1 in 15
Average stay	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9.16 days
UNITED STATES											
Total beds	311,159	.....	363,337	371,609	395,543	393,425	406,174	402,605	412,091	425,324	444,947
% increase since 1930	.....	.....	.....	.....	6%	5%	9%	8%	11%	14%	20%
% of occupancy	67%	66%	64%	64%	63%	60%	64%	67%	70%	69%	69%
Admissions	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
% increase of admissions since 1934	.....	.....	.....	.....	—0.3%	—0.5%	+9%	+23%	+32%	+35%	+43%
Ratio admission to population	.....	.....	.....	1 in 20	.....	.....	1 in 18	1 in 17	1 in 15	1 in 15	1 in 15
Average stay	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	12.4 days
RICHMOND HOSPITAL SERVICE ASSOCIATION											
Census	.....	.....	.....	.....	.....	.....	.....	1,172	4,612	14,077	25,965
Admissions	.....	.....	.....	.....	.....	.....	.....	57	385	1,484	3,119
Days of care	.....	.....	.....	.....	.....	.....	.....	587	3,069	12,543	25,713
Average stay	.....	.....	.....	.....	.....	.....	.....	10.2	8.2	8.4	8.2 days
Ratio admission to enrolled population	.....	.....	.....	.....	.....	.....	.....	1 in 11	1 in 12	1 in 10	1 in 10

the population by states and the percentage of occupancy of general hospitals by states. An interesting observation is made in this issue that the hospital beds in the United States doubled in 1918 the number available in 1909 and in 1939 was three times the number available in 1909.

Furthering my contention that the high incidence of occupancy of the Richmond hospital beds is due to lack of building rather than the fact that a Hospital Service Plan was removing the catastrophic penalty of expense for a large number of the populatinon, I have projected for the State of Virginia and for the United States as a whole, the same small increase in beds as has occurred in Richmond. In 1920 you will note Richmond had 1,046 beds. Since then Hygeia closed as also the Richmond Eye, Ear and Nose Infirmary and the Virginia Hospital. In 1928, therefore, there were only 1,011 beds and in 1930 only 1,000. Since 1930 there has been an increase of general hospital beds of 73 or 7 per cent increase. Had Virginia as a whole, built no more beds during this decade than had Richmond, the occupancy of those beds in Virginia would have been 81 per cent instead of 65 per cent; in United States the same increase would have shown a 77 per cent occupancy instead of 69 per cent. The building of hospital facilities in Virginia has caused since 1934 an increase of admissions to Richmond hospitals of only 36 per cent whereas this increase for Virginia in the same period was 59 per cent and for the United States as a whole, 43 per cent. The census of the Richmond Hospital Service Association is shown for the four years. In 1939 the average stay of subscribers to this Plan was only 8.2 days whereas for Richmond as a whole, average stay was eleven days, for Virginia 9.16 and for the United States 12.4. The ratio of admissions to the population of the Hospital Service Plan was one in ten for Rich-

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mond, one in seven for Virginia and for the United States one in fifteen. The low ratio of admissions in Richmond was due to two factors: one, the large negro population which, as you know, does not use the hospital with the same frequency as the white population and, second, to the fact that Richmond still serves a large area outside of the City. This service outside of Richmond has no doubt been curtailed by the building of better hospital facilities in the State of Virginia, West Virginia and particularly in North Carolina. The Richmond Hospital census will show a fairly high percentage of patients outside the metropolitan area of Richmond. This Plan has few negro subscribers.

To project to 1945 what will occur in Richmond is anybody's guess and the results will be based on many factors. We know that people will continue to use hospitals more and more, first because they are sold on the idea that the hospital is the place to be sick; secondly, of the difference in housing facilities with a large number of people living in apartments and third, at the insistence of the medical profession, that they can more adequately and conveniently treat ill patients housed under one roof than if they had to peregrinate from house to house. Therefore, what is going to occur in Richmond and in Virginia will entirely depend upon the realization of the Boards of control of present hospital facilities in providing additional beds and indeed a new hospital of at least two hundred beds for Richmond within the next few years.

On another tabulation I have attempted to show the percentage of hospital service plan subscribers who are hospitalized for minor conditions. I think this bears out my statement to you that a small percentage of our subscribers are being hospitalized for conditions for which they would not receive hospitalization even without a hospital contract. Our records will show rather conclusively that if physicians hospitalized subscribers to this Plan on the same basis they do their other private patients and for the relatively same lengths of stay, we could better prove that this hospital service plan is not making people ill but rather is improving their health and that instead of filling hospitals we are making more hospital beds available to the unenrolled population. We are definitely removing patients from free and part-pay beds into full pay accommodations.

M. HASKINS COLEMAN, JR. *Executive Director, Richmond Hospital Service Association.*

Medical Services to Jail Prisoners.

TO THE EDITOR:

The writer of this is one of the fairly considerable number of Virginia physicians who render medical service to prisoners in county or city jails. The remuneration for this service is wholly inadequate. The State Legislature lays down the law as to the rate of compensation, and says in substance: Take it or leave it. The rate set forth in the Code of Virginia is seventy-five cents *per day* for one patient, and fifty cents per day for any additional patient—not per visit, but *per day*. If it is necessary to see a patient two or three times a day, the practitioner is entitled to only the per diem under the law.

In addition to the small pay, another hardship, newly imposed, may be mentioned; that is, in making out his account, the medical man must first ascertain whether the sick man or woman is charged with a felony, or a misdemeanor, or a violation of the A.B.C. laws, and carry out the total to the appropriate column on the blank—a tedious and time-consuming matter which by rights should be done, if at all necessary, by a clerk in the auditor's office, who is paid to do such work. In fact, the making out of accounts, under the regulations laid down by those in charge of these things, is really more onerous than attending the sick.

Furthermore, no additional pay is allowed for any surgical work, as judge and comptroller insist they have no latitude under the law to certify accounts for payment other than on the seventy-five cent and fifty cent basis. Prisoners are often brought to jail with numerous cuts, requiring suturing and dressings, or they develop conditions while imprisoned necessitating minor surgery, such as incising boils and abscesses, or other like things. Such as this are time-consuming, and certainly surgical work, even minor surgical procedures, has always commanded rather larger fees than do routine medical visits.

This matter is one in which an injustice has been done by the State of Virginia for many years to a group of medical men, who although knowing they were being unjustly treated yet have apparently thought it too small a matter about which to make complaint. Of course, in any given case the doctor concerned could decline to render service, but his successor would then have the same injustice done him; and it is the principle of the thing which should command attention. It is becoming more and more the habit apparently for people, as individuals

as well as in the aggregate, to demand or expect free or partly free service from medical men. This is one instance in which it is time to take steps to relieve a situation. Obviously the only recourse is to have the law amended, a function only of the State Legislature.

In the event that the law-making body is called in special session, as to which there seems to be a possibility, it might be feasible to bring this into consideration at that time.

Bring this to the attention of your representatives in the State Legislature, both in Senate and in House. Let others interested speak up.

E. P. TOMPKINS, M.D.

Lexington, Va.
November 26, 1940.

Mental Hygiene Activities

The Mental Hygiene Society of Virginia has selected the Problems of the Adolescent as its main topic of study this year, since it is especially fitting that the personality problems of those most likely to compose our first line of defense should receive prime consideration. The main feature of the annual meeting held in Richmond during October was a symposium on this subject. It is planned to continue the discussions during the winter at meetings in other cities in the State.

At Norfolk, Virginia, in February there will be a discussion of Juvenile Delinquency, while in Danville in March a half day of study is being organized when the Value of Recreation will be stressed. At night a program will be given before the local Medical Society. The Mental Hygiene Society is especially anxious to arrange other meetings with medical societies throughout the State. Any local society that is interested in the possibility of arranging such a joint program should get in touch with Mrs. Donna B. Bemiss, Secretary, The Mental Hygiene Society of Virginia, 1001 E. Clay Street, Richmond, Virginia.

The high point of Mental Hygiene activities, however, will be reached next May. At the time of the annual convention of the American Psychiatric Association in Richmond there will be an evening program sponsored by the Mental Hygiene Society of Virginia. The meeting will be open to the public and the speakers the highest authorities on Mental Hygiene Problems. The Medical Profession of Virginia especially is urged to attend.

Disorders of the Personality, otherwise known as mental diseases, are fundamentally no different from any other type of disease except that the total personality reaction plays a greater role and is more manifest. The sick personality can be seen, can be felt, and is irritating in many ways. It has very much the same effect as did a body infected with smallpox or leprosy. Persons with these diseases were shut off in pesthouses to protect the public, in part it is true but, to a great extent, to enable society to escape the unsightly. If the lungs were on the outside of the body pneumonia and tuberculosis would cause something of the same social response. This is the reason that society is so anxious to hide the mentally sick in jails, penitentiaries and other special institutions for their care, where their irritating condition can be more or less forgotten.

It is hard to persuade the Medical Profession that mental disease will respond to skilled care as favorably as many and much more readily than some so-called medical diseases. The population of our State Mental Hospitals last year was approximately 10,900. The discharged patients were 237 per month, or 2,844 per year, while the admission rate was 279 per month for the first four months of this year. Forty-two more came in per month than went out. At Southwestern State, however, where the staff is somewhere near adequate, there were 148 admissions and 166 discharges; in other words, a decrease of eighteen in hospital population. The need in Virginia is not for bigger mental hospitals, but, first a more interested medical profession, better trained in the treatment of personality disorders and, secondly, a greater number of well trained physicians in our State Hospitals. The Mental Hygiene Society of Virginia is anxious to stir the medical profession of the State, to stimulate them to visualize the mental health problem, and, finally, to bring to them whatever they may need in the way of information or any other sort of aid.

Public Health Statistics

I. C. RIGGIN, M. D.,
State Health Commissioner of Virginia

The report of the Buerau of Communicable Diseases of the State Department of Health for November, 1940, compared with the same month in 1939,

and for the period of January through November, 1940, compared with the same period in 1939, follows:

	Nov. 1940	Nov. 1939	Jan.-Nov. 1940	Jan.-Nov. 1939
Typhoid and Paratyphoid Fever	36	23	259	447
Diarrhea and Dysentery	93	84	1,809	4,139
Measles	166	29	3,624	10,784
Scarlet Fever	296	227	1,586	1,338
Diphtheria	131	290	626	1,293
Poliomyelitis	48	4	231	43
Meningitis	7	4	71	57
Undulant Fever	2	0	22	21
Rocky Mountain Spotted Fever	1	0	43	48
Tularemia	0	8	39	64

THE GENERAL PRACTITIONER'S PART IN INDUSTRIAL HYGIENE

Much attention in industrial hygiene has been directed toward organization of industrial medicine within the large corporations. Those industrial corporations employing 10,000 or more workers have set up medical departments adequately staffed with trained personnel. These staffs have sponsored numerous developments in industrial hygiene such as research into the problems of inorganic dust, carbon monoxide, lead compounds, and other toxic hazards, group insurance, compensation departments, and safety education. This trend is natural and praiseworthy, but to some extent it has given the impression that the bulk of industrial hazards are confined to so-called "big industry". Of course this is erroneous.

The prevention and control of occupational hazards present the same problems for the small plant as they do for the large one. For example, the exposure to a toxic gas around one coke oven is just as real as that emanating from a large bi-product plant. If occupational hazards do not assume the importance in the small plants as they do in the larger ones, it is because the small plant lacks someone trained to recognize them and institute measures for their prevention and control.

A fact that few recognize is that 99.5 per cent of all industries employ less than 1,000 workers each and that 98.6 per cent have less than 500 workers. In other words, out of 8,838,743 industrial workers (according to federal figures) 6,678,754 are employed in plants and establishments working 1,000 men or less.

In the plant of the large corporation the industrial physician has available laboratory facilities capable of field surveys relating to potential hazards, industrial engineering, consultation and advice, as well as qualified chemists and toxicologists for maintaining the proper control of industrial hazards.

It has been indicated that the majority of workers are not employed by large corporations, and that most small plants, due to various factors connected with their operation, cannot afford to employ a full-time industrial physician, to say nothing of nurses, technical facilities, etc. How then can medical service, such as has been outlined, be made available to this large group of small plant employees?

In the majority of small plants there are few so-called classical hazards. Those most commonly present are extreme heat, both dry and moist, dampness, ventilation and lighting problems, and repeated motion. These hazards are not on the compensation schedule, but consideration of their importance as factors in absenteeism is basically an industrial hygiene problem.

To illustrate the manner of attacking common hazards, let us take the men working in a drying room. Obviously they must be given salt tablets. Again, platforms for workers to stand on in refrigerated rooms, and ventilation at certain periods during the day for offices not properly ventilated also are necessary. Individuals performing work requiring repeated motion must be watched carefully so as not to develop muscle strain, tenosynovitis, and the like. In other words, the point to remember is that industrial hygiene considerations are quite prevalent, despite the total absence of readily apparent hazards.

Toxic hazards of course are encountered in small industries and should not be overlooked; in fact the part-time industrial physician should know of the existence of every toxic hazard within his plant. If he is not familiar with the various new compounds and volatile solvents that so rapidly are being put into use, he can obtain upon request the consultation services of the Bureau of Industrial Hygiene, State Department of Health. Sanitary plant surveys also represent a part of the service rendered by the State Health Department in cooperation with the plant physician. Even with this service available, however, the industrial physician should go through the entire plant periodically and inspect thoroughly each operation.

From the standpoint of industrial employee health the main problem is providing medical supervision in small plants. Only when this is accomplished can industrial hygiene problems be recognized in these

industries and proper protection afforded. The general practitioner who is engaged in a part-time industrial practice can render a great service and produce results hitherto not accomplished.

Organized medicine recognizes the problems presented by small plant industry; and the time is quite near when more general practitioners who are doing part-time plant work will intensify their efforts.

Miscellaneous

Psychoanalysis of Great Britain

There is an id of human greatness,
Tinctured by the touch divine
In every man of British breeding,
Transfused in the Empire's line.

There is an ego, quite objective,
In their hopes and fears and pride,
Shown by their sports and way of living,
Making sure they shall abide.

And with their genes and protoplasm,
Wrongs forgiven, faults forgot,
No one can diagnose the British
As a cacogenic lot.

They have emotion-reason balance;
Win they shall whate'er the odds
For they are nature's non-defeatists—
By the cards and with the gods.

—BEVERLEY RANDOLPH TUCKER.

EXPLANATORY NOTES.—The id is the essence of the unconscious personality.

Cacogenic means having a tendency toward race degeneracy.

Genes is an hereditary germinal factor or unit in the chromosome which carries an hereditarily transmissible character.

Woman's Auxiliary to the Medical Society of Virginia

President—MRS. GRIFFIN HOLLAND, Eastville.
President-Elect—MRS. E. LATANE FLANAGAN, Richmond.
Recording Secretary—MRS. HAROLD W. POTTER, Hilton Village.
Corresponding Secretary—MRS. J. WALKER JACKSON, Machipongo.
Parliamentarian—MRS. JAMES B. STONE, Richmond.
Treasurer—MRS. REUBEN F. SIMMS, Richmond.
Chairman, Press and Publicity—MRS. HENRY M. SNEAD, Petersburg.

President's Letter

MY DEAR AUXILIARY MEMBERS:

May the coming year be one of happiness and success for all Auxiliary Members!

With the start of the New Year I hope we may all enter upon the work of each department with renewed zeal and energy which will mean a year of successful accomplishment.

The Program and Health, Public Relations and Legislative Chairman have spent much time and thought on the splendid programs they have given us.

The Press and Publicity Chairman needs your full aid and cooperation. Please send to Mrs. Snead each month accounts of meetings and items of work and recreation being done by each Auxiliary. We are all anxious to know just what every other group is doing as these items increase interest and enthusiasm and are often an inspiration to others.

Your Exhibit Chairman has splendid ideas for her work and wishes suggestions from the different Auxiliaries to help make the exhibits at the National and State meetings outstanding.

We are so anxious for a full quota of subscriptions to the *Bulletin*—if you have not already subscribed, won't you do so as soon as possible? Mrs. Holcombe asks urgently that one-fourth of our membership subscribe and I do hope that we may have this number.

The Leigh-Hodges-Wright Memorial is work that must always be foremost in our minds. The bed maintained at Blue Ridge has been constantly occupied for some time past and is of inestimable benefit.

The Cancer Control Chairman has an excellent program which will be most instructive and helpful to each Group.

Let us not forget the Jane Todd Crawford Memorial. At a meeting of the Southern Medical Auxiliary in Louisville, it was decided that this Memorial be educational in form. A committee was appointed and they will report at the next general meeting, when the final decision will be made. I know that the members of the Virginia Auxiliary are deeply interested in this Memorial and want to have a full share in carrying forward this splendid work.

Our Organization Chairman is working in every way possible to organize new Auxiliaries and we do hope for several new ones before the year is over. One of our Councilors says that he considers a membership drive a very essential part of the work and to the Presidents of all local Auxiliaries I would like to say—if there are any eligible women in your community won't you and your Membership Chair-

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man make a special effort to enroll them? The State Chairman will greatly appreciate any names sent her. I am counting on a constantly growing "Honor Roll" one of which we may all be justly proud.

If I can be of assistance to any one at any time, please do not fail to call on me for it will be a pleasure.

With best wishes to each and every member of the Auxiliary,

GRACE WILKINS HOLLAND,
(MRS. GRIFFIN W. HOLLAND).

Suggested Basic Programs

The following subjects are respectfully submitted to the Medical Auxiliaries for their consideration as basic programs during the coming year:

1. Problems of National Defense and the contributions that the Auxiliary can make in this work (see special department of Medical Military Preparedness in *The Journal of the American Medical Association*).

2. The platform and the policies of the American Medical Association.

3. A study of Surgeon General Parran's plan "Crusade against Syphilis".

4. Public Relations.

Each Auxiliary is asked to send a current issue of *Hygeia* to the President of the P.T.A.; Federated Woman's Club; District President of Woman's Club; Federation Public Relation Chairman; and see that every school in their district is a subscriber to *Hygeia*.

Each Auxiliary and, if possible, every member of the Auxiliary is asked to subscribe to the official publication, the "Bulletin".

All Auxiliaries should strive to further their ideals and accomplishments by careful planning for increased, active membership and future exhibits.

MRS. L. KOLIPINSKI,
Chairman, Program and Health.

Auxiliary Groups.

MID-TIDEWATER

A meeting of this Auxiliary was held in the home of Mrs. E. L. W. Ferry, Millers Tavern, on October 26. We had a full attendance and report three new members—Mrs. Arthur VanName, Center Cross; Mrs. Clarence Campbell, Sparta; and Mrs. William Hoskins, Stevensville.

We had as our guest speaker our President-Elect, Mrs. E. Latane Flanagan, who gave a most interesting report of the state meeting at White Sulphur Springs. She also told of "her hopes and aims for 1941-1942".

Another added pleasure was the delightful lunch which followed with our Mid-Tidewater doctors as hosts, and a group of Richmond doctors as guests.

The officers of this Auxiliary are: President, Mrs. Hawes Campbell, Venter; vice-president, Mrs. A. W. Lewis, Aylett; secretary-treasurer, Mrs. M. H. Harris, West Point; with the following committee chairmen—Jane Todd Crawford Memorial, Mrs. A. L. VanName, Center Cross; Public Relations, Mrs. J. W. Smith, Hayes Store; and Press and Publicity, Mrs. Paul C. Pearson, Aylett.

ELLIE COCKE CAMPBELL,
(MRS. HAWES CAMPBELL).

RICHMOND

At a meeting of the Auxiliary to the Richmond Academy of Medicine in December, the following officers were elected: President, Mrs. Edward H. Williams; vice-president, Mrs. J. Fred Wampler; recording secretary, Mrs. Rex Blankinship; corresponding secretary, Mrs. Harry B. Hinchman; treasurer, Mrs. Douglas Chapman; and parliamentarian, Mrs. Gordon Boisseau.

ACCOMAC-NORTHAMPTON

The officers of this Auxiliary for 1941 are: President, Mrs. J. L. DeCormis, Accomac; vice-president, Mrs. E. H. Trower, Eastville; secretary, Mrs. J. H. Hiden, Pungoteague; and treasurer, Mrs. S. S. Kellam, Cape Charles.

PETERSBURG

This Auxiliary signed its pledge to raise $900.00 to furnish the nursery of the proposed new Petersburg Hospital, and plans for raising the money were discussed at the regular November meeting. A contribution was also made for the Leigh-Hodges-Wright Memorial Bed.

A rummage sale was held on December 6 and 7, with Mrs. H. M. Snead, chairman. Proceeds from this amounted to $85.00.

Arrangements have been made for the annual linen shower in February, with Mrs. Meade Edmunds, chairman.

Officers for 1941 are: President, Mrs. E. L. McGill; president-elect, Mrs. Munford Yates; vice-president, Mrs. Fletcher Wright, Jr.; treasurer, Mrs. Herbert Jones; corresponding secretary, Mrs. W. B.

McIlwaine; and recording secretary, Mrs. Louis Kolipinski.

NORFOLK

The Auxiliary has had two regular meetings, with an opening drive for *Hygeia,* nine subscriptions having been secured. We have subscribed to the *Bulletin* for our own use and had a report covering highlights of the first issue. We renewed our obligation to continue the support of a patient at the Tidewater Tubercular Hospital. The Layette Chairman, with her committee, has reported four layettes will be completed this month.

The new officers for the coming year are as follows: President, Mrs. A. G. Horton; president-elect, Mrs. Walter P. Adams, Jr.; vice-presidents, Mrs. K. W. Howard, Mrs. J. W. Anderson, and Mrs. W. E. Butler; recording secretary, Mrs. R. M. Reynolds, and assistant, Mrs. W. L. Taliaferro; corresponding secretary, Mrs. Southgate Leigh, and assistant, Mrs. R. Bryan Grinnan; treasurer, Mrs. Thomas Spessard, and assistant, Mrs. G. W. Simpson; parliamentarian, Mrs. C. C. Smith; and historian, Mrs. W. R. Tyson.

MRS. A. G. HORTON,
President.

Book Announcements

Clinical Diabetes Mellitus and Hyperinsulinism. By RUSSELL M. WILDER, M.D., Ph.D., F.A.C.P., Professor and Chief of the Department of Medicine, The Mayo Foundation for Medical Education and Research, University of Minnesota; Head of the Section on Metabolism Therapy, Division of Medicine, The Mayo Clinic. Philadelphia. W. B. Saunders Company. 1940. xvii-459 pages. Illustrated. Cloth. Price, $6.00.

This new book on diabetes and hyperinsulinism is a welcome addition to the library. Individual phases of the disease are covered rather completely and very clearly in each chapter of the book, so that it affords us easy reference to specific topics. The information given includes not only that from the author's experience, but also from that of other men. The omission of many controversial observations and opinions is a real asset. Directions of treatment are given clearly and usually in sufficient detail to enable anyone to obtain satisfactory results. The section on hyperinsulinism gives us a complete and yet condensed report of the work which has been done in this field.

WILLIAM R. JORDAN, M.D.

Vitamin Therapy in General Practice. By EDGAR S. GORDON, M.A., M.D., Associate in Medicine and Instructor in Physiological Chemistry, University of Wisconsin. And ELMER L. SEVRINGHAUS, M.D., F.A.C.P., Professor of Medicine, University of Wisconsin; Editor, Department of Endocrinology, The Year Book of Neurology, Psychiatry and Endocrinology. The Year Book Publishers, Inc. Chicago, 1940. 258 pages. Cloth. Price, $2.75.

Our knowledge of the vitamins and of vitamin therapy is changing so rapidly that only new books and short books on the subjects are worth reading. Such a book is the one before us. Its format is inviting, its print large, its illustrations well chosen, its style simple and direct. It makes a serviceable companion to Sevringhaus's *Endocrine Therapy.*

W. B. B.

Obstetrics in General Practice. By J. P. GREENHILL, B.S., M.D., F.A.C.S., Professor of Obstetrics, and Gynecology, Loyola University Medical School, Chicago; Professor of Gynecology, Cook County Graduate School of Medicine; etc. The Year Book Publishers, Inc. Chicago. 1940. 448 pages. Illustrated. Cloth. Price, $3.50.

This excellent manual of obstetrics fills a great need. As the author states, it is not intended as competition for the standard voluminous textbooks on obstetrics. Historical data, controversial discussions, extensive descriptions of anatomy and pathology, and the less frequent complications of pregnancy and parturition have been omitted.

There are only 448 pages with 222 illustrations. It can be read in a reasonable length of time, and serves as a relatively quick and complete review of the entire field of practical obstetrics. It discusses briefly yet, completely, the present accepted methods of managing the most frequently encountered obstetrical problems. The whole subject is brought up to date, several references being to articles appearing in the current literature as recent as May, 1940.

This book is a valuable contribution, and should be a great help to all who care for obstetrical patients, particularly to the general practitioner.

W. C. WINN, M.D.

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VIRGINIA MEDICAL MONTHLY

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WYNDHAM B. BLANTON, M. D.
Editor

AGNES V. EDWARDS
Business Manager

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All correspondence regarding editorial matter, original articles, and policy should be directed to the Editor. Questions relating to subscription rates, advertising, etc., should be addressed to the Business Manager, 1200 East Clay Street, Richmond, Virginia. The MONTHLY is not responsible for the opinions and statements of its contributors. All advertisements are accepted subject to the approval of the Council on Pharmacy and Chemistry of the American Medical Association. Annual Subscription, $2.00. Single Copies, 25c.

VOL. 68. JANUARY, 1941 No. 1.

Editorial

In the Interest of a Sane Public Attitude.

There is neither need nor justification at this time for creating any alarm in regard to an impending epidemic of influenza or any other communicable disease in Virginia. That there will, however, be an increased prevalence of influenza during the now beginning winter season seems quite likely, particularly in view of the recent presence of this disease in epidemic proportions in the extreme western part of the United States. The disease in California has been relatively mild in character and not attended by serious complications in the great majority of cases and has therefore not imposed any significant increase in mortality risk. Laboratory tests have indicated that type A influenza virus was responsible for the outbreak. Rural areas, from preliminary reports, seem to have suffered the highest attack rate and it has been estimated that between 25 to 30 per cent of the population in some of the communities has been affected.

Recognizing the incompleteness of our knowledge concerning the behavior of this disease and more particularly our inability to evaluate the conditions and circumstances which predispose to its occurrence in severe epidemic or pandemic form, it would seem wise to give due consideration to the possible problem which influenza may present at some time either in the near or distant future. Especially does this seem a sane precaution in light of the importance of present activities concerned with our national defense. The occurrence of an epidemic similar to that of 1918-19 would be a disaster of most serious consequence. This would certainly be so if no better provision for emergency organization existed than in those years. Plans are therefore being formulated which it is hoped will facilitate the most efficient emergency epidemic organization in the individual communities of Virginia should the need for such organization ever arise.

The responsibility for the correlation of the activities and resources of the various official and lay agencies necessary for this organization will be placed upon the local health departments in those jurisdictions in which there are health departments operating. In those areas where there is no full-time health service the Medical Society of Virginia will assume responsibility for the organization, correlation and direction of the activities.

The most careful observation for indications of the increasing prevalence of influenza and other communicable diseases will be continued by Federal, State and local health departments and the recognition of such signs will be promptly publicized. The appearance of definite criteria, how-

ever, may not allow sufficient time for the organization of the needed forces before the occurrence of the emergency itself. It is proposed therefore to prepare in so far as possible for any emergency even though the application of this preparation may never become necessary.

I. C. R.

No Influenza Vaccine Yet.

In answer to a recent inquiry from the VIRGINIA MEDICAL MONTHLY as to whether or not the virus vaccine against influenza referred to from time to time in the daily papers was ready for distribution, the following telegram from the Rockefeller Foundation was received: "Your telegram December 16 received. Influenza vaccine still in experimental stage. Efficacy being studied but final results not yet available." If an epidemic of influenza spreads to Virginia this winter we shall have to rely on other measures than prophylactic vaccination.

Tuberculosis and the Induction Boards.

A number of years ago Armstrong conducted studies at Framingham (Massachusetts) which showed that in a city of 100,000 the expected number of active cases of tuberculosis would be 1,000. It is now generally agreed as a result of numerous other surveys that the incidence of active pulmonary tuberculosis is approximately 1 per cent of the population, and that the disease is quiescent in perhaps another 1 per cent.

In a recent survey of the results of routine chest X-ray examinations of recruits which appeared in the *Canadian Medical Association Journal* (September, 1940), W. A. Jones showed that in rough figures one out of every 100 recruits was rejected for past or present pulmonary tuberculosis. About 0.5 per cent were rejected for other causes. Jones estimated that, in pensions and in treatment for pulmonary tuberculosis, the last war has cost the Canadian government $150,000,000. He believes that the X-ray survey of the first 100,000 Canadian recruits for the present war, made at a cost of $200,000, represents a potential saving of $25,000,000.

The United States government now maintains twelve hospitals for the care of tubercular war veterans with a combined capacity of 5,068 beds. During the past year almost 12,000 veterans were cared for in these hospitals. There are in the United States today 62,614 veterans with pulmonary tuberculosis. Of these 53,343 are classified as having a service contracted disability, and 17,891 are regarded as having active lesions. It costs about $3.00 a day to maintain a patient in a hospital. Hospital construction, the salaries of personnel, insurance and vocational training are added expenses. The annual compensation allowed each service contracted case of tuberculosis is $635.00. For the non-service contracted case it is half that amount. Tuberculosis in the soldiers of our last war has cost the people of the United States over a billion dollars.

From these figures it would appear that pulmonary tuberculosis is the most important disease, actually and potentially, that faces draft boards and induction boards in their examination of "draftees." The Surgeon General and the Medical Department of the Army are determined to profit by the experience of the last war and to see that no such bill as we are now footing will have to be paid by the next generation for tuberculosis among soldiers of our new Army. It is for this reason that routine X-ray examination of the chest is a part of the procedure prescribed for induction boards.

In connection with X-ray examinations of the chest for pulmonary tuberculosis Landis has asked and answered three important questions: (1) "Will the X-ray give us information in cases presenting suspicious symptoms but in which the physical signs are absent or indefinite?" Answer: "The X-rays are not infallible. They will at times fail to show any evidence whatever on the plate although the history, the physical signs and subsequent course of the case prove it to be undoubtedly one of pulmonary tuberculosis." (2) "Will the X-rays give us an etiological diagnosis?" Answer: In early and doubtful cases, no. Baetjer and Pancoast have emphasized this. (3) "Will the X-rays indicate whether the lesion is active or inactive?" Answer: "It can be stated without much question that one cannot determine from the examination of a radiograph alone whether the disease is active or inactive."

Cocke agrees in general with the above opinion but thinks that with serial films such a diagnosis may sometimes be made. Miller thinks previous X-ray films for comparison are desirable, but regards cavitation or fluffy lesions as indicative of "at least potential activity". Webb believes that an exudative lesion which the X-ray discloses is active. At Ray Brook it is claimed that animal experiments have shown that the X-ray cannot be relied upon to show activity. At Trudeau the opposite opinion is held,

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but even there only a 75 per cent accuracy is claimed. Price believes that the X-ray diagnosis of activity is a trick that it is possible to teach only to very expert readers.

The detection of early tuberculosis by the stethoscope is a difficult and often uncertain procedure. In the last war (1917) persistent moist râles at the pulmonary apices were regarded as the only trustworthy sign of activity. It is now thought that only one in eight cases can be detected by this method.

Armed with all available knowledge, induction boards must be keen in their search for pulmonary tuberculosis. They will be tremendously helped by good X-ray films of the chest capably interpreted, but they will not forget the patient himself, his symptoms and signs. Physical examination, although unable to detect many lesions visible by X-ray, must still be relied upon as a most valuable method of discovering pulmonary disease, especially active tuberculosis.

The Doctors' Dilemma.

There are today 1,073 hospital beds in Richmond. The average stay of patients in these beds over a period of five years has been eleven days. Each bed has therefore accommodated an average of 33.1 patients annually. From these figures it is easy mathematics to determine that 35,510 is the absolute saturation point for Richmond hospitals.

Patients are not books on a shelf and they cannot be admitted and discharged from hospitals without some lag. For this reason 100 per cent of occupancy is not possible or desirable. The ideal lies somewhere between 70 and 80 per cent of saturation. Using the latter figure and applying it to the situation in Richmond, a total of 28,408 is obtained. It represents a practical ceiling under which most hospitals can be expected to operate efficiently. Keeping in mind the absolute saturation point of 35,510 and the practical ceiling of 28,408, we are prepared to consider the progressive increase in hospital admissions in Richmond as they have been tabulated for the last few years. In 1934 there were 21,777 admissions; in 1935, 22,658; in 1936, 25,220; in 1937, 27,260; in 1938, 27,628; in 1939, 29,507, and in 1940 it is estimated that there will be 30,249. The present number of annual admissions is therefore already above the practical ceiling and the present trend points to 1943 as the time when absolute saturation will be reached.

This is an alarming situation. Practicing physicians in the Richmond area are already experiencing difficulties. Patients willing and able to pay are being denied admission to hospitals because the hospitals are too crowded to receive them. The congestion promises to get worse.

In the State of Virginia as a whole there has been a 33 per cent increase in hospital bed capacity in the last ten years. This in part accounts for the fact that Richmond is receiving relatively fewer patients from out of the city than in former times. In the last ten years Richmond's population has increased by about 10 per cent, too small a figure to explain the 36 per cent increase in hospital admissions that has taken place here since 1934. It seems to us that the Richmond Hospital Service Association has been a large factor in bringing this condition to pass by making hospitalization easier and cheaper for the 41,408 members who now constitute its membership. This statement is not made in criticism of the Association, for we are convinced that more persons in Richmond should be hospitalized than are now being admitted to hospitals.

The truth is apparent. There are too few hospital beds in Richmond at this time and the acuteness of the situation is likely to be increased by the growth of the population and by the extension of group hospitalization. The new hospital of the Medical College of Virginia will prove only a partial corrective since it is understood that in the closing of the Memorial Hospital and the opening of the new hospital an addition of only 100 beds is to be now realized. It is significant that although the number of hospital beds available in the United States has trebled in the last thirty years, in Richmond we have now only twenty-seven more beds than we had in 1920.

Cancer Control in Virginia.

Every worth while movement must be able to survive a barrage of criticism. The Cancer Control Foundation is no exception.

There are those who are fed up on foundations and associations organized for promotion. There are those who view them as high pressure artificial creations designed to bolster issues unable to stand on their own feet. One hears criticism from those who dislike publicity about medicine when they themselves are omitted from it, and one hears it also from others who honestly believe that more harm than good follows it. In the case of the movement

under consideration, for example, there are some who sincerely deplore the cancer phobia that has all too apparently resulted from it. There are those who think they sense the personal profit motive in the agitation for it by physicians, and those who dislike what they characterize as the morbid desire on the part of the lay participant to be permitted backstage in medicine. Some have made fun of it, going so far as to ask why not have associations for the control of stuffy noses, or a committee to cure piles, or a foundation devoted to the relief of indigestion. Many cannot understand why the victims of cancer, heart disease and poliomyelitis should steal the show while the sufferers from other diseases are ignored.

Fortunately none of the criticism of too great or unwise zeal applies to the Virginia organization for the control of cancer which has preferred to go along slowly with its program. It is headed up and guided by men above suspicion and is now striking out in the right direction. Director Edwin P. Lehman presents the case of the Virginia Cancer Foundation in this issue of the MONTHLY. His questionnaire which is also being distributed at this time should be taken seriously by those to whom it is addressed and their opinions should be freely expressed. Too little is known about cancer for physicians to assume a cocksure attitude about it. We have an informed, earnest but modest director who, before beginning a campaign of education, is willing to be educated himself.

Proceedings of Societies

The Fairfax County Medical Society

Met on November 27 at the Penn-Daw Hotel in Alexandria for a luncheon meeting. There were twenty-two members present. Dr. Carson Lee Fifer, Alexandria, spoke on the office treatment of gynecological conditions. A lively discussion followed. A committee was appointed to handle the medical preparedness questionnaires. Flowers were sent to two members who were sick—Dr. W. P. Caton of Accotink, and Dr. F. M. Brooks of Fairfax Station, a charter member. The next meeting of this Society will be held in January.

ALICE HEYL KIESSLING, *Secretary.*

The Fourth District and Southside Virginia Medical Society

Met in Petersburg on December 27, with Dr. W. M. Phipps, president, presiding. The following scientific program was presented: Sulfathiazole and Allied Types of Chemotherapy in Children by Dr. W. B. McIlwaine, Petersburg; The Cause and Prevention of Chronic Bronchiectasis by Dr. Porter Vinson; What Every Physician Should Know about the Spread and Prevention of Tuberculosis by Dr. Ramsay Spillman, New York; New and Interesting Phases of Rheumatic Fever by Dr. T. Duckett Jones, Boston, Mass.; Abdominal Pregnancy with Report of Two Cases by Dr. J. B. Jones, Petersburg; The Heart in Pregnancy by Dr. William B. Porter, Richmond; Signs and Symptoms of Brain Tumors that Should be Familiar to Every Physician by Dr. C. C. Coleman, Richmond; and Signs and Symptoms of Certain Important Surgical Emergencies by Dr. I. A. Bigger, Richmond.

Following the program, Dr. and Mrs. Wright Clarkson entertained the physicians and their wives at a buffet supper.

Dr. C. E. Martin, Emporia, is secretary of this Society.

Fredericksburg Medical Society.

New officers for this Society for 1941, elected at its last meeting, are: President, Dr. L. F. Lee, Passapatanzy; vice-president, Dr. T. B. Payne, Fredericksburg; and secretary-treasurer, Dr. L. A. Busch, also of Fredericksburg.

WILLIAM W. BUTZNER, JR.,
Retiring Secretary.

The Hanover County Medical Society

Held its regular quarterly meeting on Tuesday, December 3, at which time the following officers were elected for the ensuing year: Dr. A. C. Ray, Jr., Ashland, President; Dr. J. A. Wright, Jr., Doswell, Vice-President; and Dr. Chas. L. Savage, Ashland, Secretary-Treasurer. After a short business meeting Dr. Kinloch Nelson of Richmond spoke to

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the Society on the treatment of syphilis.

This Society meets quarterly on the first Tuesdays in March, June, September, and December.

CHARLES L. SAVAGE,
Secretary.

Lynchburg Academy of Medicine.

Dr. Powell G. Dillard became president of the Academy for 1941, succeeding Dr. Ernest G. Scott. Other officers are Dr. John Hundley, president-elect; Dr. Carleton Moorman, vice-president; and Drs. J. R. Gorman, F. O. Plunkett, H. C. Brownley, and E. S. Groseclose, directors. The secretary will be appointed at the January meeting.

The Medical Society of Northern Virginia,

At its annual meeting on December 10, elected Dr. John B. McKee, Winchester, as president; Dr. D. M. Kipps, Front Royal, vice-president; and Dr. J. E. Harris, Winchester, secretary-treasurer (re-elected).

At the scientific session, papers were read by Dr. C. E. Foley, Front Royal, and Dr. C. L. Riley, Winchester. A motion picture on the diagnosis and treatment of pneumonia was also shown.

Petersburg Medical Faculty.

New officers elected to serve the Faculty for 1941 are: President, Dr. L. S. Early; vice-presidents, Drs. J. Bolling Jones and Philip Jacobson; and secretary-treasurer, Dr. Wilbur Bowman.

Richmond Academy of Medicine.

At the annual meeting of the Academy, held on December 10, Dr. William Branch Porter succeeded to the presidency and the following officers were elected: President-elect, Dr. Beverley R. Tucker; vice-presidents, Drs. T. Dewey Davis and O. B. Darden, and as new members of the Board of Trustees, Dr. John L. Tabb and Dr. C. L. Outland. The usual Christmas entertainment followed the meeting.

Roanoke Academy of Medicine.

At the meeting of the Academy held on November 4, the following scientific program was given: Syphilis of the Stomach by Dr. Paul Davis; The Relationship between Hodgkin's Disease and Chronic Brucellosis by Dr. June U. Gunter; and Life Insurance Medicine by Dr. D. S. Garner. Dr. William Grossmann of the State Health Department discussed Poliomyelitis at the Present Time.

The program at the regular meeting on December 2 was as follows: Case Reports—Carcinoma of the Colon, Five Year Cure; and Renal Adenocarcinoma Complicating Huge Uterine Myoma by Dr. Linwood Keyser; Verumontanitis by Dr. Frank Helvestine, Jr.; Intestinal Implantation with Lactobacillus Acidophilus by the Use of Bacillus Acidophilus Milk by Dr. J. D. Willis; and Resume of Symposium on Obstetrics and Gynecology held at the University of Virginia, November 8 and 9 by Drs. A. M. Groseclose and Rees Morgan.

The usual social hour followed both meetings.

Dr. Kenneth D. Graves is president of the Academy and Dr. Allen Barker, secretary-treasurer.

News Notes

The Roanoke Academy of Medicine

Plans a special meeting on Monday, February 3, and an invitation is extended to members of the State Society, especially those in Southwestern Virginia, to attend.

A subscription banquet will be held at the Hotel Roanoke at 6:30. The first address will be by Dr. Herbert F. Traut, formerly resident in gynecology at Johns Hopkins Hospital and now associate professor of obstetrics and gynecology at Cornell University. His subject will be "Upper Urinary Tract Infection Complicating Pregnancy" and will be illustrated with lantern slides.

The second speaker, Dr. J. E. Moore, will be introduced by Dr. D. C. Smith of the University of Virginia, who will also preside over the discussions. Dr. Moore has charge of the Department of Syphilis at Johns Hopkins and is the editor of the *American Journal of Syphilis, Gonorrhea and Venereal Disease,* and author of "Modern Treatment of Syphilis". He is a leader in this field, not only in original work, but in his manner of presenting the subject. The title of his address will be "Venereal Disease Control in the Armed Forces". The discussion will be

led by Dr. James R. Blalock of the Southwestern State Hospital, Marion; Dr. L. F. Verdel of the Veterans Facility, Roanoke; Dr. James P. King of St. Albans Sanatorium, Radford; and Dr. E. M. Holmes, Director of Virginia Division of Venereal Disease Control.

Anyone wishing reservations for the banquet should contact Dr. W. W. S. Butler, Medical Arts Building, Roanoke.

The Industrial Health Bulletin, No. 6,

Published by the Council on Industrial Health of the American Medical Association, under date of November 30, 1940, carries a check-list covering organization and activities of Committees on Industrial Health in State Medical Societies. This check-list will be of great value to the State Committees on Industrial Health. By this they can see how far short they fall of having a complete program, and it will suggest to the Committee members activities that their Committee might undertake.

Another feature in the *Bulletin* is the composite of the courses being given in medical schools throughout the country on the subject of industrial health. This composite program, of course, is more complete than any one school is offering.

The outline for the program for the Third Annual Congress on Industrial Health to be held at the Palmer House on January 13 and 14 is referred to and the program for the Monday evening meeting is outlined as well as the clinical program for January 15. While these Congresses are for the Council and the Committee members of State Societies, especially, any physician interested in industrial medicine is invited to attend. The detailed program for the first two days is given in *The Journal of the American Medical Association* for November 23, 1940.

Anyone interested in this *Bulletin* could receive a copy by writing the Council on Industrial Health, American Medical Association, 535 North Dearborn Street, Chicago.

Seaboard Medical Association of Virginia and North Carolina.

The forty-fifth annual meeting held in Washington, N. C., December 3 to 5, was well attended and the program interesting. Dr. Waverly R. Payne of Newport News was elected president and Dr. Clarence Porter Jones, also of Newport News, was named secretary for the twenty-ninth consecutive time. The vice-presidents elected at this time are: Drs. George Erik Bell of Wilson, N. C.; Wilbert E. Butler of Norfolk; P. A. Nicholson, Washington, N. C.; and L. L. Sawyer, Great Bridge. It was voted to hold the next meeting at the Cavalier Hotel, Virginia Beach, December 2, 3 and 4, 1941.

Councilor of Southern Medical Association.

Dr. Thomas W. Murrell of Richmond has been appointed a member of the Council of the Southern Medical Association from Virginia for a regular Council term of five years, the appointment having been announced recently by the President, Dr. Paul H. Ringer of Asheville, N. C. Dr. Murrell succeeds Dr. Vincent W. Archer of Charlottesville, whose term of office had expired.

Medical College of Virginia News.

The General Education Board of New York has made a grant of $168,000.00 for the further development of the St. Philip school of nursing, the unit of the college separately organized for the education of Negro nurses.

This grant will add and furnish approximately seventy-four rooms to the nurses' residence, St. Philip Hall, and will substantially enlarge the library and teaching unit. The estimated cost of this aspect of the new development is $130,000.00.

The grant also provides $38,000.00, over a six-year period, on a decreasing basis biennially for substantially strengthening the teaching program, especially on the clinical side.

Dedication of the new hospital took place on Founders' Day, December 5. Among those participating were Governor James H. Price; Colonel E. W. Clark; Dr. W. L. Bierring; Dr. Walter B. Martin; Dr. H. E. Jordan; M. Haskins Coleman, Jr., and Dr. Lewis E. Jarrett. President Sanger presided at the exercises which were broadcast over WRNL. Beginning at two o'clock in the afternoon the new hospital was opened for inspection to the general public and on Tuesday night, December 3, a reception and hospital open house were observed at the hospital for the local medical profession and specially invited guests. During Tuesday evening and Thursday afternoon and evening over fifteen thousand guests were shown through the new building, many from distant points.

Installation ceremonies of Beta Chapter of Virginia, Alpha Omega Alpha, were held at the Commonwealth Club, Wednesday evening, December 3.

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Dr. Walter L. Bierring, National President, and Dr. J. J. Moore, National Secretary, were present, Dr. Bierring conferring the charter to the college and Dr. Moore presenting the certificates and keys to the initiates. Other speakers on the program were Dr. William T. Sanger, President of the college; Dr. Lee E. Sutton, Jr., dean of the school of medicine; Dr. William B. Porter, professor of medicine, and Dr. J. Shelton Horsley. General Hugh S. Cumming and General Merritte D. Ireland were also among the distinguished guests present. Dean H. E. Jordan of the department of medicine, University of Virginia, brought greetings from his institution. Dr. Stuart McGuire was made honorary and charter member. Faculty initiates were: Dr. Frank L. Apperly, Dr. C. C. Coleman, Dr. Harvey B. Haag, Dr. William B. Porter, Dr. Harry Walker, and Dr. H. H. Ware, Jr. Students of the senior medical class initiated were Mr. Herbert C. Allen, Jr., Mr. William E. Daner, Mr. George A. Stewart, Jr., and Mr. Adney K. Sutphin.

Dr. Porter P. Vinson was recently elected president of the alumni association of the Mayo Foundation.

President W. T. Sanger was made an honorary member of Alpha (Virginia) chapter of Phi Beta Kappa at the College of William and Mary on December 5.

Dr. Walter E. Vest and Dr. R. J. Wilkinson of the Chesapeake and Ohio Hospital, Huntington, West Virginia, were recent college visitors. Dr. J. M. Emmett of the Chesapeake and Ohio Hospital, Clifton Forge, Virginia, was also a recent visitor.

News from University of Virginia, Department of Medicine.

Dr. J. M. Meredith attended the meetings of the Southern Medical Association in Louisville, Kentucky. On November 15, he read a paper before the Surgical Section, entitled Can the Site and Degree of Trauma and the Prognosis in Head Injury Be Accurately Determined by Spinal Fluid Erythrocyte Counts? An Experimental Study.

On November 19, Dr. W. W. Waddell, Jr., addressed the South Piedmont Medical Society, meeting in Lynchburg, on the subject, Vitamin K in the Newborn.

Dr. J. M. Nokes conducted a Seminar on Obstetrics and Gynecology at the King's Mountain Memorial Hospital in Bristol, Virginia, on November 26 and 27. The Seminar consisted of demonstrative clinics in the afternoon and a talk on the evening of November 26 on Anesthesia and Analgesia in Obstetrics and Gynecology.

At the meeting of the University of Virginia Medical Society on December 2, Dr. W. M. Nicholson of Duke University spoke on Water and Salt Exchange in Acute Alcoholism.

On December 4, Dr. Oscar Swineford, Jr., addressed the Seaboard Medical Association of Virginia and North Carolina on the subject, Asthma and Heart Disease.

At the meeting of the Blue Ridge Dietetic Association in Charlottesville on December 5, Dr. George M. Lawson discussed Food and the National Defense.

The Seventh Annual Post-Graduate Course in Ophthalmology and Otolaryngology sponsored by the University of Virginia was held at the Medical School from December 10 to 13. The list of those giving lectures included the following: Dr. Marvin F. Jones, Director of Otolaryngology at the Manhattan Eye, Ear and Throat Hospital; Dr. Andrew A. Eggston, Director of the Laboratories and Consultant Physician at the Manhattan Eye, Ear and Throat Hospital; Dr. James Milton Robb, Chief, Eye, Ear, Nose and Throat at the City of Detroit Receiving Hospital; Dr. Robert E. Moran of Washington, D. C.; Dr. David H. Massie, Instructor in Dentistry at the University of Virginia Hospital; Dr. Harry S Gradle, Chief of the Staff, Illinois Eye and Ear Infirmary; Dr. Frank B. Walsh, Associate Professor of Ophthalmology, Johns Hopkins University; Dr. Ralph I. Lloyd, Lecturer in Ophthalmology, New York University Medical School; Dr. F. Brittain Payne, Surgeon and Assistant Pathologist, New York Eye and Ear Infirmary; and Commander J. R. Poppen, Bureau of Aeronautics, U. S. Navy. Thirty-nine physicians registered for the course.

Married.

Dr. John Edward Hamner, Petersburg, and Miss Augusta Louise Johnson, Richmond, December 14. They will make their home in Dinwiddie County.

Dr. Joseph Ney, Harrisonburg, and Miss Carol Smith Straus, Richmond, December 5. Dr. Ney is a

Graduate of the Harvard Medical School in 1935.

Dr. Thomas Duval Watts, Richmond, and Miss Ruby Alice Lake, Jackson, Tenn., November 30. Dr. Watts graduated from the Medical College of Virginia in 1935.

Dr. Edward Stewart Orgain and Miss Ann Lewis, both of Durham, N. C., December 28. Dr. Orgain is a graduate in medicine from the University of Virginia in 1930 and is now on the staff of Duke Hospital.

Dr. Samuel Milchin of Bishop, and Miss Virginia Macom of Pocahontas, November 22. Dr. Milchin is a member of the class of '35, Medical College of Virginia.

Dr. Robert Richardson Eason, Buena Vista, and Miss Mabel Nash, Blackstone, December 21. Dr. Eason is a graduate of the Medical College of Virginia, class of 1936.

Sectional Meeting, The American College of Surgeons.

The College announces that a sectional meeting for Pennsylvania, Ohio, Virginia, West Virginia, Delaware, Maryland, New Jersey, New York, and the District of Columbia will be held March 17-19 at the William Penn Hotel, Pittsburgh, Pa. Hospital conferences will be held in connection with this meeting. Fellows of the College, members of the medical profession at large, and persons interested in the institutional care of the sick and injured, are invited to this sectional meeting; on the final evening, a meeting on health conservation to which the public is invited will be held.

Dr. Rucker Honored.

Dr. Marvin Pierce Rucker, Richmond, was recently honored by being elected as one of seventy founders of Phi Beta Kappa Associates, at the first annual meeting of the organization in New York City. Permanently limited to a membership of two hundred, the members of the organization are chosen for professional and intellectual attainment, service to culture, intellectual standards and the public interest.

Dr. Milton Salasky,

Who has been resident at the Brooklyn Eye and Ear Hospital for the past three years, announces the opening of his office in the Wainwright Building, Norfolk, with practice limited to ophthalmology and otorhinolaryngology. Dr. Salasky is a member of the class of '36, Medical College of Virginia.

Dr. Lee Scott Barksdale

Recently resigned his position as director of the Hopewell Health Department, which position he had held for a year and a half, to devote his time to private practice. He has opened offices in State Planters Bank Building that city.

1941 Essay Contest of Mississippi Valley Medical Society.

The Mississippi Valley Medical Society offers annually a cash prize of $100.00 for the best unpublished essay on any subject of general medical interest (including medical economics) and practical value to the general practitioner of medicine. Details may be secured from Harold Swanberg, M.D., Secretary, Mississippi Valley Medical Society, 209-224 W. C. U. Building, Quincy, Illinois.

Dr. Claude C. Coleman

Of Richmond attended the Post-Graduate Assembly of South Texas in Houston, December 3, 4 and 5, where he delivered three lectures. He also attended the meeting of the Southern Surgical Association in Hot Springs, and read a paper on "War Wounds of the Nervous System."

Start the New Year Right

By reading the advertisements as well as articles and news in the MONTHLY. Many advertisers offer samples and literature on their products, all of which have the approval of the Council on Pharmacy and Chemistry of the American Medical Association. These may bring to your attention things you really want. Advertisers aid materially in making this Journal what it is, and many base continuance of advertising upon the interest manifested by readers. We count on your cooperation.

Changes in Richmond Health Department.

Dr. W. A. Browne, formerly city epidemiologist, resigned his position on December 15, and is now located in Alexandria, where he is serving as health officer of that city.

Dr. B. B. Bagby, who recently retired as director of the Bureau of Child Health of the State Department of Health, will serve temporarily as chief health officer and epidemiologist, until a permanent health officer is secured.

Southern Surgical Association.

Dr. John Staige Davis of Baltimore presided at the meeting of the Association at Hot Springs, Va.,

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the middle of December, at which time many interesting subjects were discussed. Dr. Harry H. Kerr of Washington, D. C., was elected president and Dr. Alton Ochsner of New Orleans was re-elected secretary. Dr. A. P. Jones of Roanoke was named as one of the vice-presidents and Dr. Guy Horsley of Richmond was among those admitted to membership. Pinehurst, N. C., was selected as the 1941 place of meeting.

Dr. James B. Shuler,

Class of '35, University of Virginia, now with the U. S. Navy, has been transferred from the USS Drayton to the U. S. Naval Recruiting Station in Chicago.

Dr. T. F. Jarratt

Has been named president of the Jarratt Ruritan Club for 1941 and was installed in this office early in December.

National Social Hygiene Day,

A public health event, will be observed for the fifth time on February 5, in the form of a concerted drive to safeguard men in military and naval training camps and in essential industries from the ravages of venereal disease. It is hoped there may be a number of community meetings at this time. Health, civic and welfare leaders and others desiring information concerning participation in Social Hygiene Day, or program aids, may secure help from Social Hygiene Day Service, American Social Hygiene Association, 1790 Broadway, New York City.

Wanted—

A second hand Bronchoscopic Operating Table. State price to F. H. Crawford, M.D., Staunton, Va. (*Adv.*)

Wanted—

The Library of the Medical College of Virginia, Richmond, needs one number only of the VIRGINIA MEDICAL MONTHLY to make a complete file. Any one who can supply this—Volume 12, No. 10, January, 1886—will confer a great favor.

Obituary Record

Dr. Emory Hill,

Widely known Richmond ophthalmologist, died December 4, having been in ill health for sometime. He was born in Scottsville in 1883 and graduated from the Medical College of Virginia in 1907. After several years of post-graduate work and the practice of his profession, Dr. Hill returned to Virginia and opened his offices in Richmond. In 1929 he became professor of ophthalmology at the Medical College of Virginia, which position he held until about two years ago. Dr. Hill was a member of many organizations, among them the American Ophthalmological Society of which he was secretary from 1925 until 1932. He had been a member of the Medical Society of Virginia since 1907. His wife and two sons survive him.

Dr. Samuel Hutchings Price,

Montvale, died December 13. He was eighty-eight years of age and a graduate of the Bellevue Hospital Medical College in 1876. Dr. Price had practiced at Montvale for about forty years and was former president of the Bedford County Bank in that town. He also served as treasurer of the county for several years. Dr. Price joined the Medical Society of Virginia in 1876, resigned in 1880 but rejoined in 1891. His wife and two children, by a former marriage, survive him.

Dr. William Oliver Smith,

Altavista, died December 17, having been in ill health for several years. He was seventy-one years of age and a graduate of the former University College of Medicine, Richmond, in 1898. Dr. Smith was prominent in community affairs and had been a member of the Medical Society of Virginia for forty-one years. His wife and four children survive him.

Dr. Marmaduke Atkinson

Died at his home in Amelia County on December 2, at the age of sixty-one. He was a graduate of the Medical College of Virginia in 1901 and, after practicing for two years in Newport News, opened offices in Richmond where he remained until his retirement about two years ago. Dr. Atkinson was formerly a member of the Medical Society of Virginia. His wife and a son survive him.

Dr. Karl S. Blackwell.

As we go to press, we have just learned of the death of Dr. Blackwell, which occurred in his sleep in the early morning of December 26. Notice will appear in next issue of the MONTHLY.